

DECEMBER

1917

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# THE AGRICULTURAL GAZETTE OF CANADA

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GOVERNMENT AND PROVIN-  
CIAL EXHIBITION WORK

EXPERIMENTS WITH  
POTATO SEED

SCHOOL GARDENS AND  
GREATER PRODUCTION

VACANT LOT GARDENING IN  
CITIES



DEPARTMENT OF AGRICULTURE  
OTTAWA, CANADA.

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CEDING MONTH.

Vol. 4, No. 12



December, 1917

DOMINION OF CANADA  
DEPARTMENT OF AGRICULTURE

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# The Agricultural Gazette of Canada

EDITOR: J. B. SPENCER, B.S.A.

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Issued by direction of  
THE HON. THOS. ALEXANDER CRERAR  
Minister of Agriculture

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OTTAWA  
GOVERNMENT PRINTING BUREAU

1917





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# The Agricultural Gazette

## OF CANADA

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VOL. IV

DECEMBER, 1917

No. 12

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### SERVICE WITHOUT SACRIFICE

MANY agencies are at work to increase the production of food, a service which it has often been declared will win the war. Of these perhaps none have been farther reaching than the vacant-lot gardening movement. All the warring countries have exercised strong effort to make full use of Mother Earth in securing nourishment for man. In England the allotment system under the Act of 1887 has attained extensive proportions. On this continent no controlling legislation has been enacted, but practically every urban centre has done more gardening than ever before and most cities have systematically recalled to cultivation much of the fertile lands that were lying idle as a result of speculation.

Vacant-lot gardening has received impetus from two motives. Patriotism and relief from the burden of obtaining the necessities of life, have, in many places, made the efforts of organizations and individuals to get the work under way comparatively easy. Great credit, however, must be ascribed to earnest men and women who have by perseverance aroused indifferent municipal bodies to see the need and to take action.

Western cities were among the first to introduce into Canada the vacant-lot gardening movement. As readers of THE AGRICULTURAL GAZETTE know an organization in Ottawa took the work up three years ago. It was not until the winter of 1917, however, that the movement became general over Canada. Through the agencies of federal, provincial, municipal and other bodies, particularly horticultural societies, a strong campaign was carried on with a result the magnitude of which would be difficult to estimate. To give some idea of this, and to afford the fullest information on methods of organization and operation, there is published in Part IV of this number of THE GAZETTE summarized reports of the Vacant Lot Gardening work in 1917 in the cities of upwards of ten thousand population. It has been a worthy work that has enabled many thousands of men and women to secure relief, to enter into partnership with Nature and to render continuous service without sacrifice.

# PART I

## Dominion Department of Agriculture

INFORMATION SUPPLIED BY OFFICIALS OF THE VARIOUS  
BRANCHES REPRESENTED

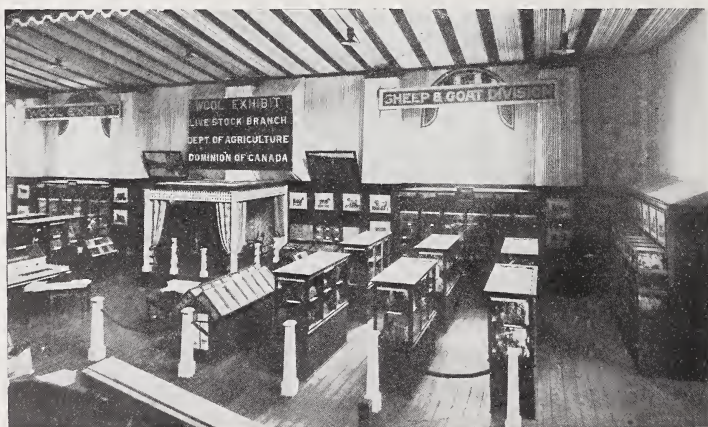
### GOVERNMENT EXHIBITION WORK

#### THE WOOL EXHIBIT OF THE LIVE STOCK BRANCH

BY T. REG. ARKELL, B.S.A., B.Sc., CHIEF, SHEEP AND GOAT DIVISION

**W**OOL in the fleece competitions which were inaugurated last year by the Minister of Agriculture through the medium of the Live Stock Branch have been more successful this year.

Entries have increased and at some fairs the secretaries were so convinced of the necessity of these exhibits that on the day of judging they increased the number of prizes; in one instance additional distinctions were arranged.



DOMINION LIVE STOCK BRANCH—SECTION OF WOOL EXHIBIT

Fleeces have been exhibited in better condition and greater numbers. There has been great improvement in the handling of exhibited fleeces and this also reflects itself on the entire output of the exhibitors.

More attention is now being paid to this matter by the fair secretaries who have experience along this line.

Most of the eastern exhibitions gave prizes in three classes, namely, Fine Medium, Medium and Coarse,



but Toronto, Ottawa and Three Rivers made their lists more complete by adding a fourth class, Lustre. Competition was keen and much good wool was exhibited by wool growers. Western fairs confined themselves to three wide classes, Fine, Medium and Coarse. However, Brandon exhibition made a more complete classification by making a difference between range and domestic wools.

A full and detailed score card is used in judging these fleeces and it has proved very satisfactory. Three defects which caused disqualification are the presence of sisal fibre or binder twine, dung locks and paint.

#### THE ENTRIES BY CLASSES

A table of the number of entries in the different classes at the principal exhibitions is herewith given:—



DOMINION LIVE STOCK BRANCH—SECTION OF WOOL EXHIBIT

	Fine	Medium	Coarse	Totals
Provincial Exhibition of Manitoba, Brandon.....	4	15	8	27
Calgary Industrial Exhibition.....	10	13	5	28
Edmonton.....	12	20	6	38
Provincial Exhibition, Regina .....	..	4	..	4
Saskatoon Industrial Exhibition.....	..	3	..	3
Vermilion Exhibition.....	3	3	..	6
Vancouver.....	4	5	4	13
	Fine Medium	Medium	Coarse	Totals
Canadian National, Toronto.....	41	16	14	71
Central Canada, Ottawa.....	18	16	6	40
Western Fair, London.....	16	26	18	60
Orms town.....	2	8	18	28
Quebec Provincial Fair, Quebec.....	4	9	9	22
Great Eastern Exhibition, Sherbrooke...	4	7	8	19
Three Rivers.....	3	7	5	15
Valleyfield.....	1	6	5	12
Nova Scotia Provincial, Halifax.....	3	3	2	8
P.E.I. Agricultural and Industrial, Charlottetown.....	4	21	13	38

At Toronto, Ottawa, Brandon and Three Rivers there were four classes.

## THE EXHIBIT

Exhibitions extending from coast to coast included the wool exhibit in instructional features and more interest was taken in it than on previous occasions. The aim of the exhibit was to show wool in all its natural phases and all stages of manufacture together with the defects at present sometimes found in the marketing of wool and their remedies.

Among the larger exhibitions visited might be mentioned:—

Ottawa Winter Fair, Ormstown,

In order to command the highest market prices wool should be presented in a carefully folded and packed condition and should contain as little foreign matter as possible. The graded product is also more acceptable to the trade than where all qualities are mixed.

Actual demonstrations in grading wool were given at the exhibitions by the wool experts in attendance and over 750,000 copies of pamphlets were distributed to those interested in sheep husbandry topics, which



DOMINION LIVE STOCK BRANCH—SECTION OF WOOL EXHIBIT

Calgary, Edmonton, Brandon, Regina, Saskatoon, Prince Albert, Vancouver, Duncan, B.C., Kamloops, B.C., Quebec, Valleyfield, Three Rivers, Sherbrooke, Halifax, Charlottetown, Summerside, P.E.I., Ottawa, Toronto, London, Windsor, Renfrew, Almonte, Ont.

The object of the exhibit is to explain fully the various classifications and grades, and to show how wool may be handled in such a way as to secure the best advantages to both the producer and the buyer.

acts as a measure to some degree to show the enthusiasm which now exists on the part of the farmers towards the sheep industry.

## INCREASE IN SALES

The exhibit has proven most helpful in arousing interest in co-operative wool sales, which this year have shown a marked advancement. Three years ago about 200,000 pounds of wool were offered for co-operative sale; this year over two and one-half million pounds have been disposed of in this fashion.

## SPECIAL FEATURES

New features illustrated this year were Canadian manufactured products of domestic wools. This included homespun rugs, mats, suitings, blankets, bed covers and stockings. Modern machinery was contrasted with the means of manufacture one hundred years ago. Various finished products made from mohair were shown, including plushes and theatrical wigs. Greater space than last year was utilized at the Canadian

National Exhibition, Toronto, where a very complete exhibit was erected. A special display was prepared showing the different classes of woolen machines in actual operation, in order that the public may understand the character of wool entering into different fabrics and the manner in which it is made. There were also exhibited all of the grades of wool produced in Canada and these compared with the qualities in other countries and foreign wool imported here.

## THE EGG EXHIBIT OF THE LIVE STOCK BRANCH

BY ERNEST RHOADES, B.S.A.

THE Poultry Division of the Live Stock Branch exhibited two classes of educational displays at the fairs and exhibitions in Canada in 1917. The accompanying illustration represents the exhibit made at the larger fairs such as the provincial exhibitions. The smaller exhibit featured especially the stand-

circumstances. Ease in handling has of necessity to be kept in mind when planning such exhibits and an endeavour has been made to erect exhibits bearing a maximum of information in a minimum of space.

The activities conducted by this Branch in connection with poultry have in the past been almost entirely



LIVE STOCK BRANCH—EGG EXHIBIT AT LARGER FAIRS.

ardization of eggs and poultry. In addition to these three older exhibits have been used at different times on account of the overlapping of exhibition dates. These exhibitions were all of a portable nature and made as attractive as possible under the

upon market improvement lines, and this work has been especially featured in the exhibits sent out. The course of the egg has been followed from the poultry flock to the consumer's table, and methods of handling at the farm and in the different



stages between the farm and the consumer have been shown as they exist and as they should be carried out in order to save the tremendous loss which has resulted in the past from poor methods of handling and marketing.

The larger exhibit (illustrated on this page) was designed to illustrate how Prince Edward Island has been organized to market her eggs and poultry co-operatively, Denmark being featured as an outstanding example of success achieved through co-operation, and Egypt as an early example of the "open market," the ideal system of marketing. An instructive feature was the electrically lighted models designed to

illustrate the system followed in gathering eggs in the country districts, delivering them to the central station, shipping to the central candling station and from there to the dock for transportation. The standards for Canadian eggs "Specials," "Extras," "No. 1's and No. 2's," were illustrated in natural colour by electrical illuminations in front of the exhibit, the eggs appearing as they do in the actual candling operation. In 1917 forty-two fairs and exhibitions were reached. At these exhibitions upwards of 220,000 people viewed the exhibit and 15,000 attended candling demonstrations most of whom applied for candling appliances and literature.

## THE EXPERIMENTAL FARMS EXHIBIT

BY W. A. LANG, ACTING CHIEF, DIVISION OF EXTENSION AND PUBLICITY

**I**N 1914 the Division of Extension and Publicity was organized with the late Mr. J. F. Watson as Chief Officer. The object of the Division, as its name would imply, is the extension of agricultural knowledge and the general publicity of Experimental Farm activities. The first steps in this direction were:—

1st. The issuing of a publication of the Experimental Farms—"Seasonable Hints."

2nd. An energetic campaign to enlarge the free mailing list.

3rd. Preparing exhibition circulars.

4th. Inaugurating a system of Experimental Farm exhibits throughout the Dominion.

"Seasonable Hints," issued three times a year, dealing briefly and practically with seasonable features of farm work, is distributed from the Publications Branch. It is prepared by the Director and chief officers of the Division and its aim is to give advice at the right time.

### EXTENT AND METHOD OF CIRCULATION

The campaign to enlarge the free

mailing list has succeeded in reaching a very large number of farmers with the lessons secured by the work of the Experimental Farms. On the requests of farmers reached, about 40,000 names are being added annually. The combined lists on all subjects now include about 275,000 names of persons to whom are sent not only "Seasonable Hints" and other general publications of the Experimental Farms, but corresponding reports, bulletins and pamphlets issued by the other branches of the Department. To the respective subject subdivisions of the list are sent the bulletins issued by the Department on the corresponding subject.

Some one hundred exhibition circulars have been carefully prepared for distribution at agricultural fairs and exhibitions. They are really much condensed and boiled down bulletins, and deal very concisely with the main features of agriculture.

### THE EXHIBITION WORK

Probably the most important work of the Division may be said to be the

exhibition work undertaken. It was decided that in order to cover as much ground as possible an exhibit should operate from each experimental farm and station, and the main features of each of these exhibits was prepared at the Central Farm. There are seventeen of these farms' exhibits and three exhibits are sent out from the Central Farm, making in all twenty travelling exhibits.

One hundred and sixty-two exhibitions were attended last year, but there are some six hundred agricultural fairs held annually, many of

and cheese making, samples of dairy products, etc.

Field Husbandry shows the advantage of crop rotations, etc.

The Division of Forage Crops emphasizes the necessity and wisdom of producing home-grown seed and features recommended, varieties of roots, ensilage corn, clover, alfalfa, grasses.

The Cereal exhibit consists of both grain in the straw and threshed grain of the different varieties recommended by the Dominion Cerealists.

Each exhibit has its horticultural



CEREAL EXHIBIT, DOMINION EXPERIMENTAL FARMS AT CENTRAL CANADA EXHIBITION

them on the same day. The exhibition season being short, it would appear, therefore, that the Division can only hope to cover all the ground in, say, three years.

#### NATURE OF THE EXHIBITS

Each exhibit is prepared with the idea of featuring some work of each Division. In Animal Husbandry are shown models of horse, cattle, sheep and hay barns, hog cabins, sheep-dipping outfits, self-feeders for hogs, the different appliances for butter

display consisting of fruit, flowers and plants, etc., selected from material grown on the local farm.

Some valuable information for stock men is furnished by the Chemical Division, illustrating the relative quantities of the various elements which enter into the composition of the different kinds of feeds, interesting information on the value of fertilizers, soil analysis, etc.

In the Botanical Division are shown various plant diseases, mounts of the different weeds, medicinal plants, etc.

The Division of Apiculture shows exhibits of honey, extracted and in the comb, and all the various beekeepers' appliances.

The Fibre Division, which is carrying on a very important and opportune work, shows what can be and ought to be accomplished in the



HORTICULTURAL SECTION, EXPERIMENTAL FARMS EXHIBIT, CENTRAL CANADA EXHIBITION

The Poultry Division features the different models of recommended colony and farmers' poultry houses, feeding appliances, recommended feeds, etc.

development of flax and its products.

The Tobacco Division shows what can be done in Canada in the cultivation of tobacco.



THE FLAX EXHIBIT, EXPERIMENTAL FARMS, CENTRAL CANADA EXHIBITION



## THE METHOD FOLLOWED

Each Experimental Farm exhibit operating from its own centre naturally features, as well, exhibits of a somewhat local character. The grain, grasses, fruit etc., shown are those suitable and successful in that particular district and the models of buildings, etc., suitable for climatic conditions.

The aim of the Division of Extension and Publicity is to have capable trained men in charge of the exhibits in order that inquirers may be met

with definite information and advice so that the suggestion "Bring your problems to the Experimental Farm officials" may bear fruit.

The great value of agricultural fairs is freely admitted. No greater stimulus to better seed selection, better cultural methods, better stock and generally better farming can be found than is prompted by the keen competition in the various classes of the average agricultural fair, and having this in mind the Experimental Farms exhibit becomes a very important adjunct to these fairs.

## THE DOMINION EXPERIMENTAL FARMS

## THE DIVISION OF HORTICULTURE

## EXPERIMENTS WITH POTATO SEED

BY W. T. MACOUN, DOMINION HORTICULTURIST

THE yields from potatoes grown at the Central Experimental Farm, Ottawa, having declined very much during the years 1906 and 1907, owing, it was thought, to two seasons of great drought, very unfavourable to the potato crop, a change of seed of six varieties was tried in 1907, the tubers being obtained from the Experimental Farm, Nappan, N.S. These potatoes yielded almost twice as much as the home grown seed and when this stock was planted again in 1908, the yield was again almost double that from the stock which had been grown for a number of years at Ottawa and which had gone through another unfavourable season in 1908. The results of the test in 1908 were published in the Annual Report of the Experimental Farms for 1909.

In 1910 seed potatoes of eleven

varieties were obtained from the Experimental Farm, Indian Head, Sask., and compared with seed of the same varieties which had been grown at Ottawa for a number of years. The average yield per acre from the eleven varieties from Indian Head was 368 bushels 30 lb. per acre and from Ottawa seed 96 bushels 42 lb. per acre, an average difference for the eleven varieties of 271 bushels 48 lb. per acre. In the cases of five varieties the yield from the Indian Head seed was over four times that from the Ottawa seed. Since that time other comparisons have been made between Ottawa grown seed and that from other sources.

Following are some of the results obtained in 1917 at Ottawa, when a comparison was made between seed from the Experimental Station, Fredericton, N.B., and Ottawa seed:

	FREDERICTON SEED		OTTAWA SEED	
	Yield per acre in 1917		Yield per Acre in 1917	
	Bush.	Lb.	Bush.	Lb.
Irish Cobbler.....	360	48	68	12
Green Mountain.....	345	24	99	00
Gold Coin.....	356	24	22	00
Carman No. 1.....	244	12	114	24
Table Talk.....	258	48	224	24

The Ottawa seed stock came from Fredericton in 1915 and had been grown only one year in Ottawa, showing rapid deterioration.

Following is a comparison of yields from seed from Fredericton, N.B., Port Arthur, Ont., and Ottawa in 1917:—

	GREEN MOUNTAIN					
	Total Yield per Acre, 1917		Yield per Acre Marketable, 1917		Yield per Acre Unmarketable, 1917	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Fredericton seed. ....	341	00	257	24	83	36
Port Arthur seed. ....	400	24	360	48	39	36
Ottawa seed. ....	85	48	68	12	17	36



HORTICULTURAL TRIAL PLOTS—CENTRAL EXPERIMENTAL FARM

Potatoes in the foreground yielded in 1917 at Ottawa less than one hundred bushels per acre. Potatoes in the back ground, behind line of stakes, grown from immature seed (from plots away from other potatoes in 1916) yielded at the rate of over 300 bushels per acre in 1917

These experiments show that there was a marked advantage in obtaining seed from any one of a number of sources.

In order to find whether a difference in soil would make any difference in the results, seed of Irish Cobbler, Green Mountain and Table Tal was obtained from the Fredericton Station in 1916 and planted at Ottawa in sandy soil, black muck, and a rather

heavy sandy loam. As the potatoes were beginning to be stolen these were all dug while the tops were still green and in the spring of 1917 were planted in rows side by side with the results in the following table. There are also given in the table the yields from the same varieties from Ottawa seed grown among the other varieties and dug with the main crop.

YIELDS IN 1917 FROM POTATOES DUG WHEN IMMATURE, 1916, AS COMPARED WITH THOSE GROWN AND DUG WITH OTHER VARIETIES, 1916

	Sandy Soil, 1916		Black Muck, 1916		Heavy Sandy Loam, 1916		Grown and Dug with Other Varieties, 1916	
	Yield per Acre, 1917		Yield per Acre, 1917		Yield per Acre, 1917		Yield per Acre, 1917	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Irish Cobbler.....	321	12	380	36	398	12	68	12
Green Mountain.....	330	00	325	36	378	24	85	48
Table Talk.....	365	12	276	6	319	00	224	24

It will be noted that the results in 1916, as compared with those grown are very much in favour of the among the poor Ottawa stock and potatoes grown from those dug when left until normal digging time. immature and grown by themselves

YIELD OF POTATOES, 1917, FROM STOCK OBTAINED FROM FREDERICTON IN 1916, AND PLANTED AT DIFFERENT DATES AT OTTAWA IN 1916, AND THE CROP FROM EACH PLANTING KEPT SEPARATE AND THE SEED PLANTED IN 1917

	1916, Date Planted	Yield per Acre, 1917					
		Total		Marketable		Unmarketable	
		Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Green Mountain.....	May 22	6	36	00	00	6	36
“.....	June 5	33	00	22	00	11	00
“.....	June 19	35	12	19	48	15	24
“.....	July 3	22	00	8	48	13	12
Table Talk.....	May 22	81	24	55	00	26	24
“.....	June 5	114	24	88	00	26	24
“.....	June 19	187	00	160	36	26	24
“.....	July 3	224	24	180	24	44	00
Irish Cobbler.....	May 22	37	24	17	36	19	48
“.....	June 5	35	12	17	36	17	36
“.....	June 19	96	48	70	24	26	24
“.....	July 3	118	48	74	48	44	00

The yields from the above tests were small and show remarkably low yields obtained from Ottawa seed, but it is interesting to note that, with the exception of the last planting of Green Mountain and the second planting of Irish Cobbler, there is a regular increase in yield from the earliest to the latest plantings, which would seem to be evidence that the potatoes which were the most immature gave the best yields. This is in accordance with experience of growers elsewhere and corroborates experience of previous years at Ottawa.

#### CONCLUSIONS IN REGARD TO SOURCE OF SEED AND IMMATURITY OF SEED

The cause or causes of the very low yields at the Experimental

Farm, Ottawa, during recent years from seed grown at Ottawa the previous year, are not yet clearly understood. The low yields began in the dry seasons of 1906, 1907, and 1908, and there have been few good years for potatoes since, and while, since that time, the diseases such as Leaf Roll, Mosaic and Rhizoctonia all have been found affecting the potato plants at Ottawa. By getting new seed every year from certain places, good yields can be obtained. While such marked results might not be obtained elsewhere as at Ottawa, a change of seed is recommended where satisfactory yields are not being obtained. It has been the writer's observation that wherever potatoes grow vigorously, as a rule, until the tops are



cut down by frost in the autumn, there will good seed potatoes be obtained, provided they are free from disease. Such sources of seed potatoes can be found in all the provinces of Canada and particularly in those parts of the provinces where the days and nights during the growing season are relatively cool and where there is usually a good supply of moisture in the soil.

Immature potatoes have been recommended for seed in England for at least one hundred years. It has been shown by the experiments at Ottawa

that the best results were obtained from the most immature seed, and while, doubtless, there is some other factor or factors than immaturity which ensure such good results from seed from the cooler parts of Canada, and which for the present may be called "vitality," it would seem, with our present knowledge that the best seed will come from those parts of Canada where, as a rule, the main part of the crop is most immature, though of good marketable size, when the tops are cut down by autumn frosts, and where there is little or no disease in the crop.

#### DOMINION HORTICULTURIST ELECTED TO IMPORTANT OFFICES

**W** T. MACOUN, Dominion Horticulturist, early in November attended the annual meetings of the American Pomological Society at Boston, and the Potato Society of America at Washington. At each of these con-

ventions Mr. Macoun was elected first vice-president. He also attended a special meeting of the Society for Horticultural Science held in conjunction with the American Pomological Society. Of this association Mr. Macoun is also first vice-president.

#### CANADIAN MAPLES FOR OUR SOLDIERS' GRAVES IN FRANCE

**T**HE Royal Botanic Gardens, Kew, England, in co-operation with the Horticultural Division of the Experimental Farm, Ottawa, has been growing maple trees from seed gathered for the purpose of transplanting the trees to the places where Canadian soldiers lie buried in France. The seed was gathered at Ottawa in 1916 of the red and silver maples, and seed of the large-leaved maple was gathered the same year at the Experimental

Station at Sidney, Vancouver Island, and sent to the Royal Botanic Gardens, Kew. The seed germinated well, and in a letter received recently by Mr. W. T. Macoun, Dominion Horticulturist, from Dr. Arthur W. Hill, Assistant Director of the Royal Botanic Gardens, Kew, it is stated that some of the young trees are already in France and growing well, and it is hoped to send a further batch of plants over before the winter.

## THE HEALTH OF ANIMALS BRANCH

### THE CHIEF PATHOLOGIST RESIGNS

Charles H. Higgins, D.V.S., B.Sc., Chief Pathologist of the Health of Animals Branch has resigned to accept the position of agent in Canada of an antitoxin manufacturing firm in New York city.

Dr. Higgins joined the Health of Animals Branch in 1899 and has,

since 1902, been at the head of the Biological laboratory established that year.

Dr. S. Hadwen, formerly in charge of the Veterinary Research Laboratory in Agassiz, B.C., has succeeded Dr. Higgins as acting Chief Pathologist.



# THE ENTOMOLOGICAL BRANCH

## THE FALSE TUSSOCK CATERPILLARS ON SHADE TREES

BY J. M. SWAINE, IN CHARGE OF FOREST INSECT INVESTIGATIONS

**D**URING the past summer the shade trees of Eastern Canada have suffered from a rather severe outbreak of defoliating caterpillars. Among the most abundant and widely distributed of these were certain densely hairy species commonly known as the *Halisidota* Tussock or False Tussock Caterpillars. They were the subject of a large number of inquiries this season from many parts of the Eastern Provinces, and, while they are not included among our most destructive shade-tree pests, they were sufficiently abundant in many places to inflict noticeable injury and to cause considerable alarm. Fortunately, they are usually controlled by their parasites before the outbreak attains very serious proportions. They are more abundant this summer, perhaps, than in any season since that of 1911, but their cocoons will probably be heavily parasitized as usual.

### GENERAL HABITS

The moths of these species appear from the cocoons in early summer and deposit their eggs upon the foliage. The caterpillars are found feeding upon the leaves during the latter half of July, August and the first part of September. By the end of September nearly all have spun their oval, hairy cocoons, usually beneath loose objects upon the ground. During October they change to the pupal stage within the cocoon and remain quiescent until the following June, when the adult moths emerge from the cocoons and appear on the wing.

The caterpillars are general feeders and are found upon many different

kinds of deciduous shade and forest trees. The Hickory Tussock and the Spotted Tussock are usually the more abundant and are responsible for considerable defoliation. The caterpillars are familiar to nearly everyone and should be recognized from the figures; the adults are modest, yellow and brown, night flying moths and are less frequently seen.

### THE HICKORY TUSSOCK MOTH

*Halisidota caryae* Harris

The conspicuous black and white caterpillars of this species are the most injurious of the false tussocks, probably owing largely to their gregarious habits while young.

### THE MOTH

The *adult* is a yellow and brown moth with a wing expanse of nearly two inches. The fore wings are ochre-yellow, heavily dusted with brown scales, with five, irregular, subtransverse, incomplete rows of spots, of which those along the costal border and towards the base are yellow, and the others transparent; the outer or distal row is submarginal. The hind wings are pale yellow, subtransparent and immaculate. The body is thickly clothed with yellowish brown hairs, with a diagonal brown line on each side of the thorax. The male moth is smaller than the female and the antennae are more featherlike.

### THE CATERPILLAR

The Hickory Tussock caterpillar is black and white, with a black head

and is about an inch and a half in length when full grown. It is clothed with dense spreading tufts of white hairs with pencils of longer white hairs in front and behind, a pair of long, black pencils of hairs on the first and seventh abdominal segments, and a row of conspicuous black spots along the middle of the back on the abdomen; one spot appears on each

#### THE PUPA

When full grown each caterpillar constructs a hairy cocoon about itself, composed chiefly of hairs taken from its own body, and the cocoons are consequently *greyish* in colour. They are stout oval in shape and about three-fourths of an inch in length, commonly found beneath



THE HICKORY TUSsock; A CATERPILLAR AND COCOONS IN DIFFERENT STAGES OF CONSTRUCTION; THE TWO IN THE UPPER LEFT HAND CORNER COMPLETED; ABOUT NATURAL SIZE. (Original)

segment and all are joined together by a narrow, median, black line.

#### THE EGGS

The eggs are white and are laid to the number of a hundred or so in a patch on the under side of a leaf during early summer.

boards and loose objects on the ground in places where the caterpillars have been abundant. Shortly after the cocoon is completed the caterpillar changes to the pupa and remains quiescent within its covering until the following June, when the moth emerges.

## HABITS

The conspicuous black and white caterpillars are found upon the foliage during the later half of July, August and early September. They are gregarious at first, the caterpillars



THE HICKORY TUSSOCK CATERPILLAR; ABOUT NATURAL SIZE. (Original)

from one egg-mass feeding together for a considerable time, and they are on this account able to defoliate entire branches. As they approach maturity the groups of caterpillars break up; the individuals wander about over the foliage, and finally seek a crevice beneath some object on or near the ground within which the hibernating cocoon is spun. Small larvae may be found by the middle of July; by the end of August many caterpillars are nearly ready for pupation; and practically all will have spun their cocoons before the end of September.

## HOST TREES

The list of food plants includes a very large number of deciduous shade trees and forest trees. Among these are: hickory, walnut, elm, butternut, hawthorn, rose, apple, ash, linden, oak and locust.



THE SPOTTED TUSSOCK CATERPILLAR; ABOUT NATURAL SIZE. (Original)

THE SPOTTED TUSSOCK  
*Halisidota maculata* Harris

## THE ADULT

The adult moth is very similar to the Hickory Tussock moth, about the same size, but with a ground colour of darker brown, with the rows of spots forming more delicate bands, and with the outer or distal row usually much larger than the others and reaching the outer margin. The hind wings are yellowish, subtransparent, and immaculate. The body is densely clothed with yellowish or brownish hairs, with a lateral brown line on each side of the thorax.



THE HICKORY TUSSOCK MOTH; NATURAL SIZE. (Original)

## THE CATERPILLAR

The caterpillar is usually somewhat less than an inch and a half in length when full grown, with a black head; clothed with dense tufts of yellowish hairs on the median segments of the body, varied by a row of disconnected black spots along the middle of the back, and with black hairs on the first four and the last three segments, interspersed with a few, conspicuous, long, yellowish white pencils.

## THE PUPA

When full grown the caterpillar wanders about seeking a suitable hiding place beneath a board or loose stone. Here it constructs a stout, oval, *yellowish*, hairy cocoon about three-fourths of an inch long, composed of silk interwoven with hairs removed from its own body. Within



the cocoon it changes shortly to the pupa, from which the moth emerges the following June.

#### HABITS

The caterpillars of this species feed upon the foliage of a large number of deciduous trees; in this country it seems to prefer alder, apple, willow



THE SPOTTED TUSSOCK MOTH; NATURAL SIZE. (Original)

and Manitoba maple, although it is usually recorded from the Eastern States as an oak-feeding species, and has been called on that account the Oak Tussock Caterpillar. It rarely occurs in sufficient numbers to cause serious injury, but in conjunction with other species of caterpillars, it sometimes disfigures shade trees or injures fruit trees sufficiently to require control.

#### THE PALE TUSSOCK, OR CHECKERED TUSSOCK

*Halisidota tessellaris* Smith and Abbot

The adult moth is of the size and shape of *caryae* and *maculata* and has markings of a similar type, but it is very much paler, with a beautiful greenish tinge which fades after death. The fore wings are very pale, marked alternately with very pale brownish and nearly transparent, transverse bands, with the yellowish scales more noticeable about the margins and at the base. The hind wings are yellowish, subtransparent and immaculate. The body is densely clothed with orange-yellow hairs, marked on each side of the

thorax with a diagonal line of blue diverging behind; the under surface of the body is very pale yellow.

The caterpillar is about one and a quarter inches long, inconspicuously coloured with yellowish-buff hairs, and with the head brownish-black; the body is densely clothed with tufts of yellowish-grey hairs, varied by a narrow, blackish line along the middle of the back, and with a pair of long, black, dorsal pencils of hairs on each of the second and third thoracic segments, and a similar pair more laterally placed on the eighth segment of the abdomen; long tufts of pale hairs are more or less distinct, particularly on the third thoracic segment.

The caterpillars feed upon a very large number of our native trees and shrubs, but they are seldom numerous enough to require special control measures.



THE PALE TUSSOCK MOTH; NATURAL SIZE. (Original)

#### CONTROL MEASURES

When the young caterpillars are numerous and the injury will apparently be sufficient to warrant the expense, the *Halisidota* caterpillars may be easily controlled by spraying the infested foliage with lead arsenate or Paris green. Lead arsenate paste\* should be used at the rate of  $2\frac{1}{2}$  pounds in 40 gallons of water, or Paris green at the rate of 5 ounces, mixed with 1 pound of freshly slaked lime, in 40 gallons of water. Orchard trees which receive the regular poisoned sprays are usually well protected.

## NATURAL CONTROL

The caterpillars are found in large numbers only after intervals of several years, and the outbreak seldom lasts longer than one season. Usually, at the end of the first season in which the caterpillars are notably conspicuous, the great majority of the cocoons will be found to be parasitized, and for several years following the caterpillars will be present in that locality in only moderate numbers. If it were not for this effective parasitic

control we should undoubtedly find the *Halisidota* Tussock caterpillars among our most important shade tree pests. Of the parasites which we have bred from the *Halisidota* cocoons the common ichneumon, *Scambus pedalis* Cresson, is the most abundant. *Theronia melanocephala* Brullé and *Amblyteles malacus* Say have been bred from *Halisidota* caterpillars by Mr. W. H. Harrington.

\*The powdered lead arsenate should be used at one-half the strength given above.

## THE LIVE STOCK BRANCH

## THE LIVE STOCK COMMISSIONER

**M**R. H. S. Arkell, M.A., B.S.A., has been appointed Live Stock Commissioner succeeding Mr. John Bright, deceased. Mr. Arkell, who is a son of the late Henry Arkell, a well-known stock raiser at Teeswater, Ontario, was born in 1880. He received his advanced education at the Woodstock, Ontario, College, McMaster University and the Ontario Agricultural College. His public service began with the position of lecturer in animal husbandry at the Ohio State University in 1904-05. During the next two years he lectured in animal husbandry at the Ontario Agricultural College and from 1907 to 1910 was Professor of Animal Husbandry at Macdonald College. In 1910 Mr. Arkell was appointed Assistant Live Stock Commissioner, which position he held until his present advancement to the office of Live Stock Commissioner for Canada.



H. S. ARKELL, M.A., B.S.A.,  
Live Stock Commissioner for Canada

## THE PORK PRODUCTION CAMPAIGN

### MEETING OF WESTERN PROVINCE REPRESENTATIVES

**F**OLLOWING up the meeting of Deputy Ministers of Agriculture and representative swine breeders from the Eastern Provinces recorded in the November number of THE AGRICULTURAL GAZETTE, page 955, a meeting was called, under instructions of the Federal Minister of Agriculture, of Deputy Ministers and representative agricultural officials and breeders from the Western Provinces and held in Ottawa, according to announcement in the GAZETTE, on November 7th. The conference, with its auxiliary gatherings, covered three days, not closing until the evening of the 9th. The Live Stock Commissioner, Mr. H. S. Arkell, presided, and the Food Controller, Hon. W. J. Hanna, attended on the first day, which was exclusively devoted to discussion of ways and means for increasing the production of hogs.

As at the first gathering, that from the Eastern Provinces, Mr. Hanna pointed out the seriousness of the situation consequent upon the shortage in both the warring and neutral countries, accelerated by the difficulties of navigation due to the submarine menace and deficiency of tonnage. A free and full discussion followed taking up the whole day, during which a resolution was arrived at to call the movement The Pork Production Campaign instead of The Bacon Production Campaign, and resulting in three committees being appointed to consider the problems that had been raised, namely, one on marketing, another on labour and

the third on feeds. In the evening the Honourable the Federal Minister of Agriculture entertained the delegates to the convention at an informal dinner, at which the Minister, the Food Controller and other speakers affirmed and enlarged upon what had been said in the morning on the gravity of the situation, not only as regards hogs but as regards all classes of live stock.

The two succeeding days were taken up by the committees in consideration of the questions involved and a series of resolutions were agreed to in accordance with the views expressed.

The resolutions adopted by the Marketing Committee pledged the hearty co-operation of the swine growers of the four Western Provinces in efforts to secure an increase in the world's meat supply, urged closer control of packers' transactions, asked that Great Britain be appealed to to buy direct from Canada and not through Chicago, requested an extension of the cold storage facilities, advocated the conscription of unused lards as a war measure for productive purposes and asked the Food Controller for certain information.

The Labour Committee favoured the exemption of *bona fide* farm labour and the Committee on Feeds urged the Government to take over the entire output of screenings and endorsed the report of the committee on feeds appointed by the Eastern Live Stock representatives.

## THE DEPARTMENT HONOUR ROLL

FURTHER LIST OF THE EMPLOYES OF THE DEPARTMENT OF AGRICULTURE WHO HAVE ENLISTED FOR OVERSEAS SERVICE

H. B. Laing, Patent Branch.

S. A. Bjarnason, Experimental Station, Morden, Man.

### CASUALTIES

F. M. McKenzie, Entomological Branch, Outside Service, (killed in action).

# PART II

## Provincial Departments of Agriculture

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### PROVINCIAL EXHIBITION WORK

#### NOVA SCOTIA

BY M. CUMMING, SECRETARY FOR AGRICULTURE

**A**T the Provincial Exhibition held in Nova Scotia this year our Department had three special lines of exhibits.

(1) Live Stock exhibit, consisting in the main of cows from the College farm that had given large productions of milk. In each case the records of the cows were prominently posted in the stalls where each one was kept, and the whole exhibit was put on as a means of inspiring those who studied it to keep a better class of live stock. In connection with this exhibit a convenient booth was prepared containing chairs where farmers could drop in and talk matters over with our men. From this booth various publications were distributed and photographs and striking posters were placed all

round the walls.

(2) Our Domestic Science Department, under Miss Jennie A. Fraser, carried on during the fair a canning demonstration in connection with which was shown a splendid display of all kinds of garden produce. A practical gardener from our institution was in charge of this exhibit. He gave practical instruction to all who requested it.

(3) A soils exhibit was fitted up under the direction of our Professor L. C. Harlow, Professor of Chemistry at the Agricultural College.

All these exhibits attracted an unusual amount of attention and if one could judge from the questions asked the work would seem to have proven well worth while.

#### CHEMISTRY EXHIBIT OF THE AGRICULTURAL COLLEGE

BY L. C. HARLOW, B.Sc., B.S.A., CHEMIST

**T**HE Department of Chemistry realizes that while the great majority of a crowd of 75,000 people at an exhibition are out for pleasure and excitement, yet there are many who are ready and anxious to learn something about so uninteresting a thing as the *soil*, the source of all wealth.

While an exhibition is primarily a place for displaying in competitions, the results of skill in the arts of

farming, mining, etc., there should be side shows of a purely educational nature. The booth of this Department was arranged with a view of not only giving information to those who are ready to study for a few minutes, but also for drawing attention to the various ways in which the Department is ready to serve the farmer.

Some were attracted by our sign:—



"INQUIRE HERE ABOUT THE  
 FREE ANALYSES OF  
 SOILS.  
 FERTILIZERS.  
 LIMESTONE.  
 FEEDING STUFFS.  
 WATER."

The soil survey work gave us a chance to display for comparison twenty representative soils from various parts of the province. Cards were attached stating the total amounts of phosphoric acid, potash, nitrogen, organic matter and lime found in each of these soils.

By samples and charts, emphasis was put upon the importance of maintaining fertility by the careful use of *home* material, such as farm manure, green manure, fish scrap and sea-weed.

#### THE FARM DEPARTMENT

BY JOHN M. TRUEMAN, B.S.A., PROFESSOR OF AGRICULTURE AND FARM SUPERINTENDENT

THE Farm Department of the Nova Scotia Agricultural College exhibited a number of cattle at the Provincial Exhibition in Halifax. Sixteen head were exhibited, made up about equally between Holsteins and Ayrshires. Large cards showing age, breeding, and production records were placed over the mature cows. Over the heifers and bulls the card showed age, breeding and records of dams. Four Holstein cows were shown with average yearly records of 18,000 lb. of milk, the lowest yield being 15,500 lb. and the highest 22,800.

Samples of limestone and marls from the numerous deposits of Nova Scotia, with pots of clover grown on lime and limed soil, pots of turnip grown on club root infested soil, treated and untreated with burnt lime and lime stone, drew attention to the much discussed question of the use of agricultural lime.

The method of testing the acidity of the soil was demonstrated. Illustrations were given of the effect of plaster and lime on the physical condition of the soil, of the variations in the power of soils to hold water and of the losses of fertilizers by bleaching.

Circulars on the chemistry of soils and limestone were distributed. About 600 interested parties discussed the problems suggested by this exhibit.

The Ayrshires, although not such heavy milkers, were exceptionally good cows and the whole exhibit illustrated remarkably well the highest type of dairy cattle.

One horse (Captain Aubrey), a handsome Standard Bred, was exhibited. He is a son of Peter the Great and has a racing record of 2.07 $\frac{1}{4}$ . He is a large handsome bay horse standing over 16 hands high and weighing 1200 lbs.

The whole live stock exhibit attracted much attention, and was of great educational value.

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### QUEBEC

#### THE TEACHING VALUE OF FAIRS

BY H. NAGANT, EDITOR, JOURNAL OF AGRICULTURE

THIS year, as usual, the various divisions of the provincial Department of Agriculture had received instructions from the Honourable J. E. Caron, Minister of Agriculture, to prepare educational

exhibits for the Quebec provincial fair and arrange for practical demonstrations, in order to take advantage of the opportunity offered by the large number of visitors, and give all the information which the latter

might require regarding the management of the various branches of farming.

Similar exhibits, although not on such a large scale, were shown at district fairs, such as Sherbrooke and Montmagny, and lectures and demonstrations were given in a large number of county agricultural fairs.

#### QUEBEC PROVINCIAL FAIR

The main exhibits of the various divisions of the Department of Agriculture were displayed in eleven different halls or pavilions, all situ-

In the sixth pavilion, interesting demonstrations on canning were given by an expert, Mr. Grise. The packing of apples was taught in the seventh pavilion, which also contained collections of apples from the provincial fruit stations, and samples of beans, peas and corn from illustration fields. Information was given on the picking and grading of apples. The stand of the Provincial Entomologist was in the eighth pavilion. It included specimens of insect pests, as well as of insecticides and fungicides in general use. The



QUEBEC PROVINCIAL EXHIBITION, DEMONSTRATION IN KILLING FOWL BY AN EXPERT FROM THE PROVINCIAL DEPARTMENT OF AGRICULTURE

ated in the eastern part of the Industrial Palace. The centre pavilion, of a very neat design, was occupied by a miniature flower garden, surrounded by comprehensive collections of potted and cut flowers. Apple exhibits were shown in the second and third pavilions by the horticultural association and demonstration orchards. In the fourth and fifth pavilions, there were sprayers with barrels, hoses, bambocs, as well as a set of implements and tools for fruit growers.

ninth pavilion was devoted to school gardens, the products of these gardens, and contained a model agricultural school museum, etc. The tenth pavilion was filled with exhibits of the sugar schools of the province, including maple syrup, maple sugar, also bee culture exhibits, such as honey, wax, hives, etc.

The Cheesemakers' Co-operative Association of the province of Quebec had an exhibit of the products which it handles in the eleventh pavilion. Ham, bacon and lard coming from

the cattle slaughtering schools of St. Valier and of Princeville were shown.

In the centre of all these pavilions, there was a general bureau of information, where the chiefs of the various branches of the Department, accompanied by their assistants, gave information and advices asked for by the public. This office was also the centre of distribution for pamphlets published by the provincial Department of Agriculture and dealing with the various branches of the agricultural industry.

The exhibit of Domestic Science

progress in the province of Quebec during the last few years.

At Quebec, a whole series of buildings (incubation rooms, where hundreds of chickens were hatched during the fair, brooders for natural or artificial rearing, model poultry houses, colony houses, fattening crates, etc.) enabled the instructors from the Department to teach the visitors the best methods of incubating and rearing chicks, the proper housing of fowls, fattening for the market, and all the operations of a well managed poultry house. A summary of the most useful indica-



QUEBEC PROVINCIAL EXHIBITION—DEMONSTRATION IN POULTRY HOUSING

schools and women's clubs, arranged by the provincial Department of Agriculture, was shown in the Arts Palace.

On the west side of the exhibition park, there was also a number of pavilions where demonstrations in bee and poultry keeping were given by experts.

#### THE TEACHING OF POULTRY-KEEPING

The poultry division participated in most of the provincial and county fairs. This industry has made great

tions was given in striking posters.

Demonstrations were also given at the district fairs by one or two instructors. They proved to be very interesting for the farmers.

In concluding we may say that the great development of poultry-keeping during the last few years in the province of Quebec is due in large measure to the practical teaching given at the provincial fair.

#### TEACHING OF BEE-KEEPING

The bee-keeping pavilion of the Department was very well equipped,



much better than in past years. A bee-hive in full operation could be seen. Everything was shown, from the old straw hive to the improved model hive, small hives for queen breeding, wax press, rolling press for wax combs, etc. Many bee-keepers

were interested in the silo for the wintering of bees. Demonstrations were given by the Department instructors. A number of professional bee-keepers were in attendance, closely following these demonstrations.

## ONTARIO

### THE PROVINCE'S AGRICULTURAL EXHIBIT AT THE CANADIAN NATIONAL EXHIBITION

BY C. F. BAILEY, B.S.A., ASSISTANT DEPUTY MINISTER

FOR some years past the Ontario Department of Agriculture has prepared an exhibit in the Government Building of the Canadian National Exhibition. Previous to this year it has been the practice to endeavour as far as possible to show the exhibition visitors the agricultural possibilities of On-

and with this in mind the exhibit was materially altered.

In the space set aside for the Ontario Department of Agriculture exhibit a booth was erected 11 x 42 ft. and was devoted entirely to "Thrift". Canning demonstrations, meat and flour substitutes such as cheese-dishes, war breads, etc., were dis-



SECTION OF ONTARIO GOVERNMENT EXHIBIT AT CANADIAN NATIONAL EXHIBITION

tario. This has been accomplished largely through the displays of high class fruit, vegetables, grain, etc. In view of the great need of increased production it was felt that the exhibit this year at least should be confined very largely to educational features,

played, and home gardens, war certificates and other matters relating to Thrift were presented. This booth was of special interest to consumers and was the centre of a great deal of interest.

In each corner of the space occu-

pied information bureaux were erected, each one devoted to a special class of agriculture. The Ontario Agricultural College occupied one booth, which was devoted to miscellaneous subjects which could not be classified. In all booths specialists were always on hand to give information dealing with their own particular line and were supplied with suitable demonstration material. Bulletins, agricultural reports and pamphlets dealing with subjects of special interest were supplied to those who made application.

In view of the importance of the potato industry and the difficulties encountered on account of scab and blight during the past year or two, demonstrations were given at timely intervals throughout the day in treating the seed for scab and also methods of preparing bordeaux for spraying potatoes. Demonstrations were also given for treating grain for smut. These demonstrations proved to be of special interest and were greatly appreciated by those who were present.

Large paintings suitably framed depicting various agricultural activities calling attention to the importance of improved agricultural meth-

ods formed a very conspicuous part of the wall decorations. While the exhibit on the whole was not as spectacular as in former years it was felt that it served a much more important part in encouraging production, which is of vital importance at this time.

The District Representatives of this Department stationed in the several counties of the province, conduct exhibits of a similar nature as the one here described, at the township and county fairs. The exhibits made by E. F. Neff in Norfolk county might be used as an example. A large assortment of bulletins on this subject were made available to visitors. Samples of jars of different kinds of fruit and vegetables attracted much attention. Practical demonstrations were given of methods of keeping fresh such vegetables as carrots, beets and celery by packing them in sand. Exhibits of corn in the ear of different varieties were tabled to show the difference in maturity of the different varieties. Poultry house and other poultry equipment were shown in miniature. Great interest is said to have been taken in all of these and more particularly in the corn variety demonstration.

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## MANITOBA

### SEED GRAIN FAIRS AND DRESSED POULTRY SHOWS

**B**ETWEEN 50 and 60 combined seed grain fairs and dressed poultry shows are being held in Manitoba and will continue to the middle of December.

Under the new Manitoba Agricultural Societies Act the prizes for the dressed poultry shows will be awarded

on a new basis. Instead of the Department of Agriculture giving special prizes, as in the past, it will pay in cash 60 per cent of the money actually awarded as prizes. In connection with the seed-grain show the Department awards 66 $\frac{2}{3}$  per cent.

## SASKATCHEWAN

## AT THE INTERNATIONAL SOIL-PRODUCTS EXPOSITION

THE Saskatchewan display at the International Soil-Products Exposition and Dry-Farming Congress held in Peoria, Illinois, from September eighteenth to twenty-ninth, covered a space of sixty feet and consisted of sheaf and threshed grains, corn, fruit, vegetables root crops, forage crops, alfalfa, clovers, millets, native and tame grasses and other crops, such as hemp, buckwheat, hops, vetches, etc.

A feature of the exhibit was a mechanical arrangement showing a continuous stream of wheat in the shape of a waterfall. The fall of wheat was set in a painting representative of scenes in Northern Saskatchewan. The wheat fell on a revolvingsphere, and the whole thing was designed to convey the idea of Saskatchewan's part in "breeding"

the world. Charts of an educational nature were placed in appropriate locations in the exhibit. One of these charts showed the value of sprouting potatoes before planting, another the effect on the yield of corn by planting at varying distances between the rows. Others indicated the difference in acre profits resulting from seeding at different times, at different rates, or on land differently tilled.

In the individual section, as recorded in the November number of THE AGRICULTURAL GAZETTE, page 994, Saskatchewan carried off two sweepstakes, fourteen first premiums, ten seconds and nine thirds. Saskatchewan as a province was awarded third place for the display of vegetables.

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If it were not for the needs of our allies in Europe there would be no Food Controller in Canada at all. If Canada were isolated there would be no scarcity but a super-abundance of food supplies in this country. It is a supreme duty towards her allies who are bearing the stupendous burdens of this conflict that Canada is called to increase her food production to the utmost and to avoid waste if it would avoid defeat. For our European allies the business of the Food Controller is to enable these countries to live on what they can raise for themselves or import from America. It is a problem of conservation and distribution, for urgent necessities have already ensured the maximum of production. For Canada, on the other hand, the business of the Food Controller is to enable Canada to export the greatest possible amount of food. It is thence a problem of conservation and production. In England and France they are seeking to make the food supply suffice, in Canada we are seeking to make the surplus over what suffices as great as possible. The importance of this service cannot be exaggerated. The seriousness of the shortage which faces Europe is impressed upon all who know the situation. "Thy need is greater than mine"—this should be our response to every demand upon us, to every call to work and save, to every appeal to abstain or to sacrifice in order that our comrades across the seas may not suffer this last privation.—*Professor R. M. MacIver, in Canadian Courier.*

# EXPERIMENTS WITH POTATO SEED

## QUEBEC

### MACDONALD COLLEGE

BY T. G. BUNTING, B.S.A., PROFESSOR OF HORTICULTURE

WE have been securing part of our seed in the past from New Brunswick and part from our own crops. From experience we have found that our land is not altogether suitable to potato culture, and the seed quickly deteriorates, so that after the first or second year the crops from our own seed are low and often badly diseased.

We have not conducted any special experiments along these lines, but have followed carefully the experiments conducted at other Stations, and at the present time we are firmly convinced that, in most cases, it is desirable for us to secure seed from such supplies as furnished by New Brunswick.

## ONTARIO

BY DR. C. A. ZAVITZ, PROFESSOR OF FIELD HUSBANDRY

THE source of supply of potatoes and the stage of maturity at which the potatoes are dug exert a marked influence on the tubers for seed purposes.

### SOURCES OF SEED POTATOES

In each of four years an experiment was conducted at the Ontario Agricultural College in testing, under uniform conditions, potatoes obtained from different sources. For instance, eighteen lots of Empire State potatoes were secured from eight different

sources, five being in the province of New Brunswick and three in Ontario. Seed potatoes grown about one hundred and forty miles north of Guelph in Muskoka district, near the Muskoka Lakes, gave a higher yield per acre than those obtained from any other source in each of the four years of this experiment. In one year there was some rot in the potatoes, and the results for that year were not satisfactory. The returns for the other three years were as follows:—

SOURCE OF SEED	1914	1915	1916
	Bush.	Bush.	Bush.
Old Ontario.....	166.5	114.4	220.3
Muskoka.....	300.3	251.3	350.3
New Brunswick (Source 1).....	205.4	235.5	232.3
New Brunswick (Source 2).....	261.3	232.3	218.1

The average results show that the yield in bushels per acre for old Ontario was 167, for Muskoka 301, and for two sections in New Brun-

wick 220 and 237 respectively. Somewhat similar results to those obtained at Guelph have been secured by other experimenters. Seed potatoes



grown in Scotland gave excellent results in the experiments conducted on the Experimental Farm of Cambridge University in England. Mr. W. T. Macoun, of the Central Experimental Farm, Ottawa, has obtained high records from seed potatoes produced at Indian Head, Sask. It is a common practice of some of the potato growers of the warmer climates to purchase their seed potato occasionally from a northern district possessing a cooler climate. Potatoes which are grown in a locality where the summers are comparatively cool, and where the tubers do not reach a full stage of maturity, give better results than the potatoes produced in a climate especially with a hot, dry period in July or August, and in which the potatoes become thoroughly ripened.

#### IMMATURE SEED POTATOES

An experiment was conducted at the College in each of four years in testing the value of immature potatoes for seed purposes. Six varieties of potatoes, comprising two each of the early, the medium, and the late kinds, were planted at intervals of two weeks, from May 31st until July 12th, and tubers of each variety were obtained from each of the four crops and all were planted about the first of June in the following year. The average of the four years' results in bushels per acre per annum from seed potatoes obtained from

each of four dates of planting, two early, two medium and two late varieties, showed that the more immature the potatoes were which were used for seed purposes the greater the yield of crop produced. The increase in yield per acre corresponds exactly with the immaturity of the tubers. Our various experiments have shown that immature potatoes have a special value for seed purposes. The superior value of northern grown potatoes is probably due to the fact that they are produced in a cool, short season and are harvested at an early date and before they are fully matured. The special value of seed potatoes grown at a high elevation could probably be explained in the same way. Somewhat similar results might be obtained in a warmer climate by using the second crop or immature potatoes for seed or by growing the seed potatoes on heavy damp land, in the shade of trees or under a mulch of from four to six inches of straw or of coarse manure. The results of experiments conducted in Nebraska have shown that seed potatoes grown under a mulch have compared favourably with seed potatoes obtained from a more northerly district. It should be remembered that the potato is an underground stem and not a seed. The study of immature potatoes for crop production has an important bearing on potato growing and particularly so in the warmer climates.

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#### MANITOBA

BY JAMES A. NEILSON, DEPARTMENT OF HORTICULTURE

WE have not conducted experiments at the Manitoba Agricultural College to ascertain the influence of the maturity and sources of potato seed upon the crop produced. We have however, given the subject considerable study. It is becoming generally understood that northern grown seed

is superior in some respects to seed grown in latitudes farther south. The state of maturity seems to have some effect on the following crop. Some growers contend that immature seed will produce an earlier crop than fully matured seed. For this same reason I presume seed grown in northern regions is recommended for

planting in southern sections as it is liable to be more or less immature.

During the past spring I had occasion to prepare a small bulletin on potato culture. While engaged in gathering data for this publication I found some information which was rather interesting to me.

At the Rhode Island Agricultural Experimental Station, Dr. Hartwell and Dr. Damen have studied the effect, upon the yield, of early and late harvesting where potatoes were grown under the same conditions and were fertilized exactly alike. The first harvesting was made when the leaves were beginning to die and the last one when the vines were practically dead. The following are the

results of the experiment:—

Date of Harvesting	Bushels per Acre
Seed	
July 11th.....	162
" 31st.....	338
Aug. 5th.....	371
" 12th.....	393

It will be seen from this table that the crop was nearly  $2\frac{1}{2}$  times as great when the potatoes were allowed to mature as it was when it was harvested when the leaves were just beginning to die. In northern regions, where the growth of potatoes is likely to be stopped by frost, the hastening of maturity, whether by proper fertilization, cultivation or budding, is likely to be an important factor in increasing the final yields.

## QUEBEC

### THE STUDY OF VETERINARY SCIENCE

BY CHAS. H. HIGGINS, B.S., D.V.S., PATHOLOGIST

THE consideration of the subject of Veterinary Science in Canada would not be complete without mention of the Montreal Veterinary College, which was established in 1866, and later became the Faculty of Comparative Medicine and Veterinary Science of McGill University.

#### AN OUTLINE OF VETERINARY PROGRESS

Late in the fifties of the last century, the subject of Canada was beginning to be a topic for discussion among the students of the Veterinary Colleges in Britain. It was about this time that the late Dr. Andrew Smith migrated to Canada, settling in Toronto, where he established what is now known as the Ontario Veterinary College. Shortly after this an inquiry was sent to the Royal (Dick) Veterinary College of Edinburgh for a graduate who would be able to undertake the practice of his profession in an Ontario locality. The man selected for this mission,

by the then director of this school, Professor Dick, was Dr. Duncan McEachran, who is now so well and favourably known as a veterinarian of eminence, not only on the North American continent but throughout the world.

#### STORY OF THE SCHOOL

Shortly after Dr. McEachran's arrival in Canada he identified himself with the Ontario Veterinary College, which was then a private enterprise. Not feeling satisfied with the outlook for higher veterinary education he severed his connection with this school and located in Montreal, where he established the Montreal Veterinary College, and this school may be said to be the pioneer for higher veterinary education on the North American Continent. This institution was established in 1866 and maintained a three-year course before a similar curriculum was required by an English-speaking school. After a successful career of many

years, during which period there were graduated a number of well-trained practitioners of veterinary medicine and some who have since risen to high distinction in their profession, the Montreal Veterinary College was absorbed by McGill University and became, as previously stated, the Faculty of Comparative Medicine and Veterinary Science of that institution. The ideals of this school were high at a time even when veterinary education in Canada was in its infancy. During its later years, owing to a change in the curriculum of the medical school of the University, difficulties presented themselves in connection with the courses available for students in Comparative Medicine. These difficulties with the lower entrance requirements of other schools and the absence of endowments made it desirable to discontinue the course.

In recent years there have been a number of attempts to re-establish this school as an integral part of McGill University with adequate provision for laboratories, hospitals for large and small animals and the other accessories required to provide proper training facilities. The war, however, will undoubtedly delay action in this regard for a further indefinite period.

#### HIGH STANDARD OF THE INSTRUCTION

During its existence the school required an adequate matriculation examination and the courses of in-

struction were of a very high order. The members of the faculty laboured for high ideals rather than for adequate financial remuneration. Such ideals naturally precluded the probability of a large attendance, as quality and not quantity was the aim.

The work accomplished by the school is reflected by the prominence which the graduates enjoy wherever they may be located. The present Veterinary Director General for Canada, Dr. F. Torrance, who is president of the American Veterinary Medical Association, the largest association of the kind in the world, is a graduate of this school. Other examples could be cited but would not speak more effectively for the training which the school gave than the average graduate wherever he may be found.

The degree given by the original school, the Montreal Veterinary College, was V.S. (Veterinary Surgeon), but after affiliation with McGill University the degree carried an added significance and was D.V.S. (Doctor of Veterinary Science). This was the first school within the British empire to confer the doctorate degree upon a veterinary graduate. So favourably was this school considered by the British authorities that its graduates were permitted to practice in Great Britain before a similar privilege was granted to the graduates of any other colonial institution. It is to be hoped that this school may be revived and continue on its high idealistic career.

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# ONTARIO

## THE WINTER FEEDING OF LAMBS

BY J. P. SACKVILLE, B.S.A., LECTURER, ANIMAL HUSBANDRY, O.A.C.

IT is pretty generally recognized that in order to secure the maximum returns from animals offered for sale they should go to the market in prime condition. From a national standpoint it is possibly of more importance at the present time on account of the world-wide shortage of meat that all animals should be finished reasonably well, as every pound of extra flesh added increases the available supply to just that extent. Further, the superior quality of well-finished animals usually brings its reward in an enhanced price.

Having regard for these facts and keeping in mind that the supply of feed throughout Ontario this year is fairly plentiful, it is quite possible that some farmers are arranging to hold over their lambs to finish for the market in January or February. Not a few lambs are being marketed this year in thin condition, as a visit to the larger markets will reveal.

### NOTES OF REQUIREMENTS

The following notes on feeding and general care should give satisfactory results provided judgment is used in applying them.

There is this to be said in favour of the policy of winter-feeding lambs, it absolutely means the male lambs must be castrated, which in itself would be of great educational value in flock management.

The ration to feed will depend largely upon the feeds available, which on most farms consists of clover or alfalfa hay, and roots, and silage, and home grown grains such as barley and oats. Barley and oats have given satisfactory results, in fact barley compares very favour-

ably with corn, which is considered one of the best fattening grains to be had. The addition of oats tends to make the ration rather more palatable, and, particularly at present prices, would cheapen it somewhat.

The amount of grain to be fed will of necessity depend upon the length of the feeding period, and the condition of the lambs. As a rule it will require from sixty to ninety days' feeding to bring the flock up to a proper finish. It is very important not to feed too heavily at first, and bring the lambs up to full feed without at any time overdoing it. A set-back of a few days by overfeeding is serious, as much valuable time is wasted before they again commence gaining.

### PROGRESS AND METHODS

For the first fifteen days not more than  $\frac{1}{2}$  lb. of the grain mixture should be fed. This could safely be increased until at the end of the first month they would be getting from  $\frac{3}{4}$  lb. to 1 lb. per lamb per day, depending upon the length of time to be fed. Gradually increase this amount up to say  $1\frac{1}{2}$  lb. each, when they would be on full feed. At no time should it be necessary to feed over this amount.

At the commencement of the second month the grain ration could be made up of  $\frac{1}{4}$  lb. of oil cake. This would, of course, increase the cost but would tend to put on a superior finish. No better use can be made of screenings, made up in many cases of weed seeds mixed with broken and shrunken grain, than by feeding it to lambs. The writer has in mind a flock of lambs that were well finished



and no other grain than screenings were used. In case any are available they could be fed alone or mixed with the grain ration.

Well cured clover or alfalfa hay, along with some roots and with the grain ration suggested above, should bring the lambs up to a good finish in from two to three months. As a rule, not more than from 1½ lb. to 2 lb. of hay will be consumed per head. The addition of roots adds to the succulency, as well as providing variety to the ration. Where roots are not available good quality silage could be substituted, the roots or silage to be fed at the rate of from 4 lb. to 6 lb. per lamb, per day.

#### HOUSING AND MANAGEMENT

In addition to the ration to be fed, the question of housing and general management is an important factor. In order to make satisfactory gains the quarters should be reasonably roomy, dry, light and of a proper temperature, which for sheep means fairly cool. To further make the flock comfortable, they should be dipped before being put into their feeding pens, as tick-infested lambs will not make satisfactory gains. It is scarcely necessary to mention that water and salt should be supplied regularly. Where fairly well-bred vigorous lambs are being handled a gain of around 2 lb. each week might be expected.

### SPECIALISTS MEET TO DISCUSS POTATO SITUATION

BY JUSTUS MILLER, B.S.A., ASSISTANT COMMISSIONER OF AGRICULTURE

A CONFERENCE of potato specialists and growers was held at Toronto on October 30th and 31st. The meeting was called by Dr. G. C. Creelman, Commissioner of Agriculture. There were present potato disease specialists from the Departments of Agriculture of the United States, the Dominion of Canada and the Province of Ontario, federal and provincial seed specialists, vegetable growers, and District Representatives.

#### PHASES OF POTATO INDUSTRY

All phases of the potato industry affecting Ontario were thoroughly discussed, the following receiving special attention: standardization of varieties; potato diseases—nature, spread, injury and control of leaf roll, mosaic, curly dwarf, leaf streak, wilts, tip burn and rhizoctonia; seed supply for Ontario—best sources of supply and best means of getting growers to secure seed from those districts; production—methods of cultivation, fertilizers, potato machinery, spraying and storage; grading, marketing and introduction.

Two questions that received much attention were the desirability of northern grown seed potatoes and the spread, injury and control of several comparatively newly-discovered diseases which have apparently become widely established in old Ontario. To secure accurate information regarding these questions an investigation was made last summer by the Ontario Department of Agriculture. Farmers were visited in every potato-growing district in New Ontario and in the three counties in old Ontario where potatoes are grown most extensively. In each case a thorough examination of the growing crop was made.

#### DISASTROUS DISEASES

At the conference the results of this investigation were given. Briefly summarized, the report was as follows: While but one case of leaf roll was found in Northern Ontario this disease was very prevalent in all districts visited in old Ontario. In only two fields in these latter districts was none of the disease observed, in several the percentage was not large,

but in many over 50 per cent was found. Since 8 per cent is considered by pathologists to be serious, and as plants diseased with leaf roll yield but one half to one third a normal crop by weight, and the tubers from such hills are mostly unmarketable, this prevalence of disease, it was thought, might account for Ontario's small average yield during the past 35 years of 116 bushels per acre.

Mosaic seems fairly evenly distributed over the whole province, but the percentage is small. It is not so serious a disease at present as leaf roll, and has not yet greatly reduced yields. Immediate steps must be taken, however, to arrest its development and spread in the province.

None other of the so-called physiological diseases were observed to any extent in the province, and apparently have not yet become established except in isolated cases.

Blight is much more prevalent in old Ontario than in the North, while the Colorado Beetle is not at all established in two northern districts.

#### NORTH ONTARIO'S SEED SUPERIORITY

All told, four times the amount of serious disease and ten times the amount of less serious disease was found present in old Ontario than in Northern Ontario. Throughout the North, generally, the crop was also much more vigorous, and far larger yields prevailed.

So far as the investigation was carried there can be no doubt that it proved Northern Ontario to be far superior to old Ontario as a source of first-class seed potatoes. The districts which appealed most to the investigators as sources of seed supply were as follows: Thunder Bay, Algoma, Nipissing, Parry Sound and Muskoka. Mr. G. W. Collins, District Representative for Thunder Bay, estimates that in that district alone between 500,000 and 1,000,000 bushels of choice seed potatoes might eventually be produced.

In discussing these so-called physiological diseases the evidence of all the pathologists present went to prove that leaf roll and curly dwarf are both communicable and hereditary, while the opinion was that mosaic probably was communicable and certainly hereditary. There was no evidence given to prove that these diseases contaminated the soil.

It was the opinion of those pathologists present that there was little hope of ridding old Ontario of its most serious potato disease—leaf roll—by selection; that the only remedy would be the importation of disease-free seed potatoes from unaffected districts. As all were of the opinion that in a district subject to dry periods with hot nights these diseases either originated through impaired vitality or were developed by specific organisms not yet isolated, the sources of seed supply for old Ontario, therefore, would have to be located in northern districts—preferably in Northern Ontario.

In this connection no evidence was available to prove how long such seed could be re-planted in old Ontario before these so-called physiological diseases became established. Mr. W. T. Macoun, Dominion Horticulturist, was inclined to believe that it would pay our farmers to import disease-free, vigorous seed from Northern Ontario each year, but would not go on record as definitely advising this. He suggested that experiments be conducted at once to prove the point.

It was emphasized by Mr. P. Murphy, Dominion Laboratory of Plant Pathology, Charlottetown, P.E.I., that while these diseases would not originate in Northern Ontario, due to the climatic conditions which prevail there, yet they would readily develop and spread from diseased tubers if these were imported from contaminated districts and used for seed. In this way he explained the small percentage of mosaic—in a few cases the percentage was high—which exists. He

advised a very careful and thorough inspection of these fields in order to prevent the contamination by disease of this important source of supply.

### CONTROL OF DISEASES

The general consensus of opinion regarding the control of these diseases was as follows:—

(1) To encourage the planting in old Ontario of disease-free, vigorous, northern grown seed, preferably from Northern Ontario.

(2) To initiate a scheme of inspecting Northern Ontario potato fields, roguing out disease and impurity, hill selecting the best plants for seed and certifying as to the character of seed potatoes exported to southern districts. In this connection the production of high quality seed potatoes for planting in old Ontario was not alone considered, as Northern Ontario may very well become a source of supply for portions of several of the States of the Union.

(3) To conduct a survey in old Ontario to ascertain the full extent to which serious diseases have become established, and to eliminate as seed (by education) all stock infected with inheritable disease.

### NORTHERN GROWN SEED

Dr. W. A. Orton, United States Department of Agriculture, Washington, declared that all experiments and practical experience in the United States confirmed the belief that those districts where a comparatively cool, moist climate prevailed, with long days of sunlight during the growing season and cool nights with heavy dews, were especially adapted to the production of highest quality seed potatoes. Northern Ontario, he believed, measured up extremely well to these qualifications. Where less favourable conditions prevailed—as in old Ontario and the majority of the States—a large yield of commercial potatoes might be secured, but weather conditions impaired the vitality of the tubers and gradually made them unsuitable for seed. In many potato-growing districts of the United States seed potatoes were secured each year from Maine, Wisconsin and the Maritime Provinces. He was of the opinion that the

favourable climatic conditions enumerated were responsible for the virtue of the seed stock rather than the immaturity of tubers grown in these districts. A light soil, he believed, was superior to heavy soil for seed production. In conclusion, he gave it as his belief that the yields throughout old Ontario could easily be increased 100 per cent by the planting of northern grown seed and the general practice of skilful cultural methods.

Mr. W. T. Macoun and Dr. C. A. Zavitz, Ontario Agricultural College, each gave convincing reports of their experiments in proof of the high yielding quality of northern grown seed potatoes. The former had increased yields from under 100 bushels to over 300 bushels per acre with the same variety and exactly the same environment by importing seed from the Maritime Provinces and from the North-west. The latter had planted seed from the Maritime Provinces, Northern Ontario and old Ontario under exactly similar conditions for five years, and each year Northern Ontario seed had led in yields, with the Maritime Provinces seed second and old Ontario third. Both experts agreed that immature seed grown in old Ontario gave much heavier yields than matured seed, but both favoured the development of a seed potato trade between Northern Ontario and old Ontario.

### IMMATURITY OF SEED INCREASES YIELDS

With but one exception all the practical growers present at the conference who had had experience with northern grown seed concurred in the opinion that it was preferable to old Ontario seed potatoes.

### COMMITTEE APPOINTED

After the conference the following committee was formed to make recommendations to the Commissioner of Agriculture regarding the immediate and permanent improve-



ment of the potato industry of the province:—

Dr. C. A. Zavitz, Ontario Agricultural College, Guelph, chairman.

Justus Miller, Asst. Commissioner of Agriculture for Ontario, secretary.

R. S. Duncan, Supervisor of District Representatives, Ont. Dept of Agriculture.

F. C. Hart, Director, Ont. Co-operation and Markets Branch.

Professor J. E. Howitt, Ontario Agricultural College, Guelph, Ont.

S. C. Johnston, Chief, Ontario Motion Pictures Bureau.

G. Collins, District Representative, Ont. Dept. of Agriculture. Thunder Bay District.

P. Murphy, Dominion Laboratory of Plant Pathology, Charlottetown, Ont.

G. C. Cunningham, Dominion Laboratory of Plant Pathology, St. Catharines.

L. H. Newman, Secretary, Canadian Seed Growers' Association, Ottawa, Ont.

T. G. Raynor, Dominion Seed Inspector for Eastern Ontario.

After due deliberation the committee submitted the following recommendations:—

#### EXTENSION WORK OUTLINED

(1) *Re The Standardization of Varieties for Ontario.*

That in view of the large number of varieties grown in the province and the quantities of impure seed planted annually in consequence:—

(a) The Irish Cobbler be especially recommended as a standard early variety to be grown generally in Ontario for commercial purposes and the Early Ohio be recommended as an extra early variety to be grown on a limited scale by market gardeners in those localities where a very early variety is required to take advantage of a special market.

(b) The Green Mountain be specially recommended as a standard late variety to be generally grown in old Ontario for commercial purposes and certain other late varieties notably Carman No. 1,

Dooley, Rural New Yorker No. 2, etc., be recognized as standard varieties and be recommended for those districts where conditions are peculiarly favourable for their growth.

(c) These specialists do everything in their power to give the individual potato growers all information possible regarding the eradication of disease and the best methods of potato crop improvement while rogueing fields, and that they also assist as far as may be possible in the educational campaign, hereinafter recommended.

(3) *Re Securing Northern Grown Seed Supplies for old Ontario Farmers.*

That in view of evidence from many sources regarding the superiority of Northern grown seed potatoes:—

(a) The Ontario Government proceed at once to buy a quantity of the best northern grown potato seed available, preferably from Northern Ontario, to be used for experimental and demonstration purposes in old Ontario next year.

(b) The Ontario Government at once make plans to aid farmers and growers to locate the best northern grown seed potatoes preferably from Northern Ontario, in carload lots for next spring's planting.

(4) *Re The Establishment of a Government Source of Supply of the Highest Quality Seed Potatoes Grown in Northern Ontario.*

(a) That a part of one of the farms, or parts of several of the farms in Northern Ontario now owned by the Ontario Government, be used as a source of supply of the very highest quality of seed potatoes, and used also as a station or station for potato improvement work.

(b) That as soon as possible the Ontario Government buy a quantity of the best potato seed available in Northern Ontario to be planted next spring on the acres of land set aside for the purpose, the resulting crops to provide: (1) material for selection in improvement work, (2) choice seed to be used by District Representatives for school fairs and demonstration purposes, (3) seed to be used for the Experimental Union in co-operative experiments, (4) seed to be used for all other experimental and demonstration purposes in old and Northern Ontario, (5) seed for planting on those farms in old Ontario owned by the Ontario Government which are best adapted to potato growing, these farms in turn to become sources of seed supply for the surrounding districts, (6) seed of a particularly high guaranteed quality to be sold to potato seed growers co-operative societies as foundation stock.

(5) *An Educational Campaign.*

(a) That the Ontario Government at once initiate an educational campaign, using



all educational and publicity agencies at its command, and, if necessary, creating new agencies, to the end that potato growers be fully informed of the seriousness of some of the diseases prevalent in the province; that the growers in old Ontario be made cognizant with the desirability of seed potatoes grown in Northern Ontario and be encouraged to purchase the same and that farmers and growers in all districts be stimulated to as rapid an improvement of the potato industry as possible.

(b) That in this connection the Ontario Government make plans to begin next spring a series of experiments and demonstrations widely spread over old Ontario to prove in a forceful and convincing way the high yielding and relatively disease-free quality of seed potatoes grown in Northern Ontario.

(6) *A Committee to Study Grades and Grading.*

(a) That a committee be appointed at once by the Ontario Government to suggest setting some standard grading of potatoes if such a standard, after investigation, be deemed advisable.

(b) That the Ontario Government suggest to the Federal Government the desirability of setting such standard grading for the Dominion as may be decided by the committee.

(7) *A Potato Specialist.*

(a) That a man be appointed at once by the Ontario Government to have charge of all potato extension work in the province, to co-ordinate the efforts of all agencies heretofore suggested, to organize the whole improvement scheme in its broader phases, to prevent duplication of work in any form, to direct all educational and publicity campaigns and to supervise all literature concerning any phase of the potato industry which may be published for distribution by the Ontario Government. This man, in short, would be responsible for all work undertaken by provincial officials in connection with the potato industry, and for the close co-operation and co-ordination of effort of all those engaged in the work.

(8) *An Advisory Council.*

(a) That an Advisory Council be appointed to enable the potato specialist to work efficiently and without friction; this Council to consist of not more than six men who would meet regularly to confer with the potato specialist.

(b) That this Council would represent every interest comprehended in this scheme of potato extension work, including the practical growers.

(c) That at these meetings of the Advisory Council the policy to be followed along lines heretofore enumerated as within the scope of the duties of the potato specialist would be decided by mutual agreement.

## BETTER FARMING SPECIAL

THE Ontario Department of Agriculture, in co-operation with the Grand Trunk Railway Company, is operating a better farming special train over the lines of the Grand Trunk Railway between Toronto and Cornwall. This work is financed from the funds provided under THE AGRICULTURAL INSTRUCTION ACT. The cars are equipped with exhibits including motion pictures of approved methods of agriculture, including drainage, fertilizers, seed production and cropping,

poultry and live stock feeding and management, water supplies, etc. An efficient staff accompanies the train to give addresses and conduct demonstrations. At a number of points evening meetings are held in public halls. The train commenced at Cornwall on November 27th and will conclude at Agincourt on December 21, making stops at the principal towns west as far as Port Hope, then detour to Millbrook, Peterboro and Lindsay and then on to Agincourt.

## DISTRICT REPRESENTATIVE ACTIVITIES

## PLOUGHING COMPETITIONS

IN the County of Peterboro ploughing competitions have been held this autumn on the several farms of the competitors. The competition was organized by Mr. F. C. McRae, District Representative. The competition was open to all ploughmen in the county. Competitors were required to plough at least five acres in stubble. They were privileged to use any kind of plough. Thirteen ploughmen entered the competition and eleven competed. The judges used the following score card:—

Crown.....	20
Straightness.....	15
Evenness of cut.....	20
Evenness of depth.....	20
Covering of grass and stubble.....	20
Finish.....	20
General appearance.....	20

Total..... 135

Five prizes were offered. 1st, \$15; 2nd, \$12; 3rd, 10; 4th, \$8, 5th, \$5. Both old and young competed. This competition gave impetus to the county match which was held at a later date.

## THE PAYING OF SCHOOL FAIR PRIZES

In the county of Dufferin, Mr. H. A. Dorrance, District Representative, has adopted a new method of paying the prizes to the winners at the school fairs. Instead of taking the time to visit the various schools and paying the prize money as had formerly been done, this year a money order was issued in favour of the teacher for the amount won by her pupils and with it was enclosed a statement of the winnings and a request that the teacher allot the awards. This plan not only expedited the payment of prizes, but it secured the co-operation of the teacher in a work in which she is keenly interested.

## A SCHOOL FAIR PARADE

At the school fair held in Morrisburg the parade proved to be the most interesting feature. The children marched to the music of an orchestra, and the general deportment and marching ability exhibited would be hard to excel. The parade serves to give the people an idea of the number of children taking part in school fair work in the particular township represented. The impression thus gained makes it easier to collect contributions for prizes. While the parade was in progress an interested citizen went among the people and collected \$15 which enabled each school taking part to secure a prize. The parade has the other valuable feature of taking the children away from the exhibits while the judging is in progress.

## TEN LESSONS IN AGRICULTURE

At the School Teachers' convention held at Mount Forest in Wellington county, Mr. R. H. Clemens, District Representative, outlined a scheme whereby the teachers could put on ten lessons in agriculture. The scheme provides one lesson a week for ten weeks, as follows:—

*First lesson*—Testing seed.

*Second lesson*—On soils, using a lamp glass full of dry sand to demonstrate capillary action.

*Third lesson*—On weighing milk, using a spring scale and a pail in estimating the difference in the value of cows.

*Fourth lesson*—Churning, with stress placed on ripening the cream, which, if properly understood would reduce the hours of churning very materially in many farm homes.

*Fifth lesson*—The horse's foot, showing the hoof and describing the parts.

*Sixth lesson*—Manual training.

*Seventh lesson*—Entomology, for which the children would gather cocoons, fallen plums, etc.

The eighth, ninth and tenth lessons are of corresponding character.

At the end of ten weeks it was proposed to have an agricultural night in the school, ten children to take part. The first boy would explain what happened to the cocoon and would tell about the life history of the plum curculio in a three-minute speech. The first girl would give her experience and the experience of others in churning butter. The second boy would explain the different parts of a horse's foot and their function; some other children the seed testing experiment, and so on, until the ten lessons had been dealt with by the pupils. Some of the older children, it was proposed, should follow in the social part of the evening with entertainment. It was further proposed that the teacher should explain the necessity of having a good agricultural library in the school for the use of the people in the section. She would appeal for contributions towards the purchase of the necessary books, and would thus begin the formation of an agricultural library. The teachers at the convention heartily approved of the proposed plan. Mr. Clemens promised his co-operation to the extent of supplying the teachers who desire to take up the work an outline of each lesson one week in advance.

## VISITS FOR CONSULTATION

During two weeks Mr. A. P. MacVannel, District Representative of Prince Edward County, received 130 callers at his office who came in to consult him concerning the poultry show, Board of Agriculture, the purchase of sheep, diseases of poultry, farm tractors, school fairs, Government assistance with reference to the transportation of breeding and feeding stock, dairymen's association meeting, the identification of apples, the Fruit Marks Act, etc.

## POULTRY ASSOCIATION FORMED

In the county of Haldimand a poultry association has been formed, having for its motto "More and Better Poultry." The association has a membership of upwards of seventy-five and others in prospect. It holds monthly meetings at which pre-arranged programmes are carried out. At a recent meeting a class of utility poultry judging was conducted by Mr. J. W. Clark of Cainsville, brother of the Seed Commissioner. The birds in the class were donated to the association, and after the demonstration was completed the birds were auctioned off to the highest bidders, the receipts going into the funds of the association.

## ORGANIZING FOR SHORT COURSES

BY J. W. STARK, B.S.A., DISTRICT REPRESENTATIVE, PEEL COUNTY

THE first announcement of the short courses in agriculture and domestic science to be held in January was made at the board of agriculture meeting held in the town hall last February, and we made use of every opportunity to keep the matter before the attention of the people in that district, through mentioning it when speaking to the pupils in connection with

the distribution of school fair material at garden parties during the summer, at the school fair, and to the women's institutes and farmer's clubs. There has been no paid newspaper advertising in connection with this course, although we got considerable publicity by newspaper articles. First, I wrote one announcing that we would hold the course in the Ebenezer district if enough young people could



be guaranteed to attend, and this article also gave general explanations in connection with the two courses. Two weeks later there was an announcement in the paper of the organization meeting that was to be held, and then after the meeting we gave it a full write up in the local papers. Although the meeting was held on rather a rough night, the attendance was very good, and at the conclusion of the meeting, when we called for all those who expected to be able to attend to stand up, we got 26 names. It is expected, of course, that the canvass being conducted will increase this number further still. I think the main thing in working up these courses is to secure the assistance of the best and most influential men in the district and get them to do the boosting. We were able to do this to our satisfaction this fall, and men drove long distances to speak at the meeting to help it along. Within three days after this organization meeting was held, three farmers from different sections of the township came in to apologize for not being at the meeting that night.

NOTE.—The short courses being arranged by Mr. Stark in Peel county correspond closely with courses to be held in most of the counties in Ontario this coming winter. The agricultural course will commence on January 8th and finish the 1st day of February. The domestic science course will take place from January 21st to February 1st. The agricultural course will include studies on live stock,

dairying, feeds and feeding, veterinary science, field crops, poultry, fruit growing, vegetable growing, soils and cultivation, fertilizers and manures, farm drainage, bee-keeping, insects and plant diseases, weeds and weed seeds, bacteriology, co-operation and markets, farm management, arithmetic and business correspondence, farm buildings, and public speaking. The subjects to be taken in the domestic science course are vegetables and fruit canning, milk, cereals and cheese, meat, meat substitutes, war breads, simple desserts and salads. In the announcement of the courses Mr. Stark presents an appeal to prospective students which may be suggestive to extension workers throughout Canada.

#### AN APPEAL

Tom Hyde, the tinker, when asked just before his death if he had anything to say, replied, "Tell the tailors to remember to make a knot in their threads before they take the first stitch."

There are a great many things that are begun and finished in a day or a week or a few years and if we make a mistake we can often fix it up again. But we make our start in life just once. Let us see that the first stitch holds, for then we shall be sure that the whole fabric of our later life will be strong.

Never before in the history of the world has there been such a demand for well trained, efficient young men and women as there is right now. Canada will also in the years that follow the war need men and women who have been thoroughly equipped for the business in which they are engaged. It is our privilege and our duty to take a good first stitch now by preparing ourselves for the very best service.

These short courses are planned expressly to meet the needs of those who wish to know the newest and best things in farming and homemaking, but who are unable to leave home long enough to take an extended college course at Guelph.

### MARKETING HOGS CO-OPERATIVELY

BY WALTER H. SMITH, B.S.A., DISTRICT REPRESENTATIVE, LEEDS COUNTY

**A**S forecasted in the September number of THE AGRICULTURAL GAZETTE, the several agricultural co-operative organizations in the county of Leeds have been co-ordinated into a county-wide organization. After organization, one of the first undertakings was to commence the co-operative marketing of hogs. In this we have made a

very satisfactory beginning. Up to October 20th we have marketed four car loads with excellent results. Our Rules and Regulations are very simple. They merely consist of regulations by means of which the hogs are to be sold on a graded basis. Hogs graded select, that is, of bacon type between the weight of 170 and 220 lb., are paid for at the top price,



while 50c per 100 is taken off on hogs that are too light, the same cut being made on extremely fat hogs. Extra heavy hogs are sold according to market specifications for their respective classes. As a result of the organization, we have been able to pay our members an advance over regular market prices at local points at from 25c per 100 lb. to \$1.20 per 100. We have also benefited non-members due to the fact that since our co-operative shipping has been inaugurated, local buyers are following the market considerably closer than had been previously the case. Non-members are receiving approximately 50c to \$1.00 per 100 more for their hogs from competitive buyers.

We have had the experience of local buyers endeavouring to break our association, and this has been a good thing for non-members, and has in no way shaken the confidence of our members in the work of the association. We realize that our organization is not perfect, and we intend to improve our system as occasion demands.

#### GRADING AND SHIPPING

At the present time we are selling our hogs f.o.b. shipping point. There is an understanding between the packers and our Co-operative Association that the District Representative be responsible for the grading and the valuation of the hogs shipped. We have had no difficulty with any of our farmers finding fault with our grading, and consequent cuts, nor have we had any complaint from the

packers in regard to the class of stuff shipped in their respective grades. As intimated in our constitution, and a point that is always kept before the members, is quality is our aim. Only by marketing a superior class of stuff do we hope to obtain advanced prices, and all our work is done with this end in view.

Practically all the information in connection with loading the car, giving prices and sales, is done by our local manager over the telephone. The members keep our manager posted as to when their hogs will be fit to ship, and the members are given an opportunity to ship in turn as the hogs are finished. To date we have had no difficulty in getting almost the exact number of hogs required for our car. The manager knows in advance just who is going to bring in hogs on the certain date, consequently we have not had to overload our cars, nor to turn back any members who have brought in pigs.

The hogs are all paid for when delivered. The local weigher does all the weighing. We believe it in the best interest of the Association to have the weighing done by an impartial man in no way connected with the association.

We find it is not necessary to charge much commission in connection with the hog shipping propaganda, and if at the end of the year there is any surplus as result of these commissions, it will be divided among the shippers in proportion to the value of hogs marketed. I might state that all hog quotations to members are net at the car.

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#### SALE OF AGRICULTURAL COLLEGE LIVE STOCK

THE annual sale of live stock of the Ontario Agricultural College was held on November first. The offerings consisted of Shorthorn, Holstein, Ayrshire, Jersey and fat cattle and Yorkshire swine. All, with the exception of a few cows,

were young animals. The short-horns were divided into two classes, beef and dual purpose.

Of the beef shorthorns, nine animals were sold, six of which were males, which brought an average price of \$322.50, the highest price

being \$450.00 for College Diamond. The three females sold respectively for \$1100, \$600, \$365, the highest priced animal being Augusta Snowdrop

Of the dairy Shorthorns, three males and two females were sold. The bulls brought an average price of \$140.00, the highest being \$185.00. The females, Puddington Solo and O.A.C. Waterloo Baroness 3rd, sold for \$525 and \$475 respectively.

Of the Holsteins, three only were males. These sold for \$250, \$100 and \$80 respectively. Eight Holstein females were disposed of, bringing an average price of \$169.68 $\frac{3}{4}$ . The highest price was \$225 for Beauty of O.A.C. 3rd, having a Record of Performance record at five years of 14,808 pounds of milk and 648 pounds of butter and a Record of Merit of 18.13 pounds of butter in seven days. The heifer calf, Mollie

Rue Rattler 3rd, was purchased by the School of Agriculture, Kemptville, for \$152.50.

The Ayrshires sold consisted of four males and two females. The males brought an average price of \$55.62 $\frac{1}{2}$ , the highest price being \$70 for the yearling Floss 5th Masterpiece. The females, Bud's Minnie and Floss' Guarantee 2nd, were sold respectively for \$155 and \$150.

The Jerseys disposed of were three young bulls that sold respectively for \$80, \$75 and \$55.

The two fat cattle sold brought 19c and 20c per pound respectively.

The Yorkshire sale was made of twenty-nine sows which brought an average price of \$61.38, the highest price paid being \$95. for O.A.C. 2770. Her litter mate, O.A.C. 2772, was purchased by the Kemptville School of Agriculture at \$72.50

## MANITOBA

### THE VALUE OF SWEET CLOVER AS A FEED

THE economic value of white sweet clover has frequently been called into question. That it will produce heavy crops of hay is admitted; that it possesses much feeding value for animals that eat it is also universally conceded; that it is a comparatively hardy crop is attested by the fact that it will often reseed itself and live in the same spot for years; that it has possibilities as a weed fighter is accorded by those who recognize its vigour of growth; but as to whether it is sufficiently palatable to cause animals to eat it from choice is the question.

The Manitoba Agricultural College has been experimenting with this crop, and they are now able to say that their cattle have both been pasturing upon it and are heartily eating it as hay. The advocates of sweet clover contend that many animals must acquire a taste for the plant, and after that they are fond of it. This seems to be the experience at

the College this year. In the pasture field was an area of sweet clover, and another area of alfalfa. During the early summer the cattle pastured down the alfalfa but scarcely touched the sweet clover. The latter was then cut for hay. Later in the season the alfalfa was short in growth, and the green second growth of sweet clover was attacked by the cattle with the result that after they had acquired the sweet clover habit they pastured continuously upon it for the remainder of the season. Whether or not the same cattle will eat sweet clover with the same avidity next spring will be watched with interest. The College has never had any difficulty in having animals eat the sweet clover hay.

The particular patch of ground used to grow this sweet clover was an unsatisfactory plot that had refused to grow grain and corn, and was sown to sweet clover in an effort to find some crop that would succeed.

## SHORT COURSES IN FARM ENGINEERING

**T**HE Eleventh Annual Short Course in Farm Engineering for threshermen and farmers will begin at the Manitoba Agricultural College on Tuesday, January 15th, 1918, and continue until Friday March 15th. Students attending must be at least eighteen years of age. The course will include gas engine work, steam engines, boilers, forge shop, farm mechanics, concrete construction, building construction, farm machinery and physics.

The large engineering building, in

which the course will be held, is admirably equipped for teaching the work suggested. It is U shaped, has three full stories and has a frontage of 160 feet and a depth of 110 feet.

Students from Manitoba will be required to pay a registration fee of twenty dollars. Students from outside provinces will be charged a fee of twenty-five dollars. Students can obtain board and room in the college residence at five dollars per week. No more than sixty-four students will be accepted for the course.

## SASKATCHEWAN

## THE LEGISLATURE APPROVES HOG PRODUCTION CAMPAIGN

**T**HE Saskatchewan Department of Agriculture and the University of Agriculture of the province are actively engaged in furthering the increase of the raising of hogs. They have been greatly heartened by the adoption of the following resolution by the legislature of Saskatchewan, which has been in session since Nov. 13th:

Whereas the enlistment of men formerly engaged in agricultural production, and the wastage incidental to warfare have caused a serious reduction in the world's supply of food, and

Whereas the efforts of the Food Controller are rightfully directed to the conservation of wheat, beef and bacon which are so urgently needed to sustain our armies to victory, and

Whereas prominent livestock men were recently convened in Ottawa to organize a campaign for largely increased pork production in Canada in 1918, and

Whereas the latest Dominion census reveals the fact that on 41,482 farms in

Saskatchewan no pigs were raised in 1916, and.

Whereas the world situation promises a keen demand for all kinds of meat animals for years to come although the present crisis can most satisfactorily be met by the raising of pigs in large numbers,

Therefore be it resolved that this Assembly, which clearly recognizes the past achievements of Saskatchewan farmers in food production in spite of serious difficulties such as the scarcity and high cost of feed and the shortage of labour, which under existing conditions is likely to be even more acute in the future, does, nevertheless, urge upon our people the urgent and absolute necessity of their further participation in the war by the production of pork by every farmer to the limit of his ability, and

Be it further resolved that in order the better to encourage and insure the desired production of pork, the Food Controller do immediately take such action as shall effectively eliminate all unfair and unnecessary profits from the time the hogs leave the farmer's yard until the bacon reaches the consumer's table.

## SALE OF WOOL

**B**ELOW is given a statement of wool handled by the Co-operative organization branch of the Saskatchewan Department of Agriculture in 1917. There were

623 consignments totalling 223,445 lb. of wool, marketed. The following table shows the grade of the wool and the prices realized for each grade:—



Grade	Lb.	Price Realized
Fine and fine medium staple.....	3,137	63c.
Fine and fine medium clothing.....	11,419	58c.
1/2 blood staple.....	14,887	67c.
3/8 blood staple.....	50,093	68c.
1/4 blood staple.....	63,256	68c.
Low quarter.....	31,814	68c.
1/2 blood clothing.....	20,802	63c.
Medium clothing.....	10	65c.
Black.....	1,483	55c.
Medium washed.....	794	75c.
Tub washed.....	297	80c.
Murrairie dead.....	73	40c.
Dead.....	232	55c.
Damaged.....	248	55c.
Seedy.....	13,429	55c.
Tags.....	3,197	22c.
Mohair.....	127	40c.
Pelts.....	46	30c.
	Total	Average
	215,344	65c.

Shipments received after August 1st sold locally, 8,100 lb. at 54c.

In a letter accompanying the foregoing statement, Mr. W. W. Thom-

son, Director, Co-operative organization, writes:—

I may explain that all of the wool that reached Regina before August 1st was forwarded to Philadelphia, where it was graded and sold. This wool brought an average price of 65c. per lb., while the 8,100 lb. which was received in Regina after August 1st was sold locally at a flat price of 54c. per lb.

#### ENCOURAGEMENT OF SHEEP BREEDING

All of the two thousand head of sheep purchased under The Live Stock Purchase and Sale Act have now been placed, and orders for more are on hand and coming in rapidly. A circular letter is being sent out to sheep owners, asking them to advise the Department of any sheep they may have for sale.

#### THE YEAR'S POTATO CROP

A SPECIAL effort has been made to ascertain as accurately as possible the quantity and condition of the potato crop in Saskatchewan this year. A list of questions was sent out by the Bureau of Statistics to its correspondents. An estimate was then made of the acreage and yield, which gives 67,000 acres under this crop, an increase of slightly more than 44 per cent over last year. The yield is estimated at 102.4 bushels to the acre, while the price at the present time ranges from 75 cents up to as high as \$2 per bushel in places where potatoes are scarce. On the whole the condition

was good and an average crop was the rule in most parts of the country. From the information secured a map has been prepared on which each municipality was coloured to show either a surplus, a shortage, or a sufficient quantity to meet local demands. Of the municipalities from which replies were received, 58 or 31.5 per cent show a shortage; 88 or 47.5 have a sufficiency; 39 or 21 per cent have a surplus. The shortage lies principally in the south-western part. Owing to an early frost some farmers were caught before they had an opportunity to dig their crops.

#### LIVE STOCK COMMISSIONER FALLEN IN ACTION

CAPT. J. C. Smith, Live Stock Commissioner for Saskatchewan, fell in action at the front on Nov. 10th. Capt. Smith is the fifth officer of the Saskatchewan Department of Agriculture who has lost his life in the war, the others

being Major A. F. Mantle, Deputy Minister; H. N. Thompson, Commissioner of the Weeds and Seeds Department; E. H. Hawthorne, Field Agent, Weeds and Seeds Branch; and H. Pawley.



## PART III

# Rural Science

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### SCHOOL GARDENS AND GREATER PRODUCTION

#### NOVA SCOTIA

BY L. A. DEWOLFE, DIRECTOR OF RURAL SCIENCE

**S**CHOOL gardens in Nova Scotia were given over very largely to vegetables this year. Potatoes and beans were the staple crops. Aside from "greater production", these crops have put the soil in better shape for future general gardening.

Early last spring we held small rural science teachers' institutes in several centres. In this way we reached about 500 teachers. The enthusiasm which usually results from an institute was carried back

to the schools. As a result, about 42 acres of land were this year cultivated by school children.

Owing to the change of teachers at mid-summer, we have been unable to get reports on the total amount produced or on its value.

Next year, we hope to have more travelling teachers in the field, who will not only follow up the work at planting time but who will be on hand in the fall to keep track of the harvesting and of the exhibitions.

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#### NEW BRUNSWICK

BY R. P. STEEVES, B.A., DIRECTOR, ELEMENTARY AGRICULTURAL EDUCATION

**S**INCE the organization in 1913 of this Division of the Agricultural Department it has been our purpose to develop plans that could be put into operation in the elementary schools and which would have both educational and productive intent. Our fundamental object was at the first to increase the value of the school for the community that supported it, to direct the instruction given into channels related to local improvement. It was recognized that the movement of populations from the country to the town and city, was essentially

in a large degree influenced by educational conditions, by the quality and quantity of instruction given in the schools. The country was not keeping pace in production with the needs of the city's increasing army of consumers, the cost of food stuffs was advancing and the opportunities because of keen competition for "corners" were becoming greater. Morally, productively and commercially the situation was serious and the remedy seemed to us to lie in education.

The war has actually accentuated those conditions. It has in three

years produced a state of things that normally would have taken fifteen or twenty years to bring about.

#### OBJECT AND AIMS

Our plans seek to magnify the local or, better still, the consolidated school, to give instruction through industry, to bring industry into the school, to cause education to help in solving the problems of local improvement. Accordingly we in 1913 sought to equip the school for this task, in apparatus and in quality and matter of instruction.

We reasoned if in the school a vision of country life possibilities could be given to the children of the province the next generation might witness a change for the better. The school must change first; instruction in theory from practice must be inaugurated. If the district is to be helped through education the impelling power must gather force at the school. The school must, therefore, get into the eye of the people as a central figure in the community. What it teaches, the things it does, if it properly interprets environment, will find opportunity for execution in the homes. Instruction at school related to the community should as a result promote community improvement, both in increased production and better living and in consequence greater national prosperity.

We have held to our plans and have endeavoured logically to evolve them. Because of war conditions, however, we have sought this year to extend production far beyond the school garden and the natural expansion of home plot work. We have in addition in towns and villages had central plots cultivated by children. In some cases in districts where there are no school gardens, home and central plots have been undertaken under the supervision

of the teachers. These have been the result of patriotic appeals to enlist school effort in production for war purposes.

#### GOOD RESULTS OBTAINED

This year to all pupils reported to this division, whether in schools carrying on our special work or not, who have actually engaged in increased production work while still remaining at school, we have distributed buttons like the one illustrated.



The special supervisors who this year visited school and home plots during the vacation period promoted to a great degree increased production. So far as we have yet been able to judge this strengthening of our staff work has had excellent results. Official contact with the pupils at their homes, with the parents in the interests of the children has been very gratifying.

Statistics at the time of writing were not available that would enable us to give an approximate estimate, either of the total number of acres cultivated, or the amount of yield through school children's work this year. We feel sure, however, that many hundreds of tons of produce have been added to the supply through this means. The success of our school fairs demonstrates that a wide-spread interest has been given to this line of school appeal.

## ONTARIO

BY J. B. DANDENO, Ph.D., INSPECTOR OF ELEMENTARY AGRICULTURAL EDUCATION

THE primary schools of Ontario in which classes in agriculture are conducted, carried out a fairly well organized plan for food production in 1917.

The effort was put forth in four directions: (1) To produce plants of food value only; (2) To exercise the area under crop; (3) To induce other schools to undertake to produce crops; (4) To raise chickens as home projects.

The methods employed to direct the teachers and pupils was to reach them by circular explaining the need and giving an outline of the method. Special circulars on school gardens and poultry projects were issued by the Department of Education to the inspectors and teachers concerned at the time most effective to produce results.

Instruction was given regarding these matters during the summer course for teachers at the O.A.C. during the previous summer and also on other occasions at teachers' conventions, trustees' associations, and in classes while visiting schools.

## EXTENT OF THE WORK

The amount of food actually produced as a result of this effort is of course difficult to estimate, but some idea may be obtained from the following: About 950 schools in Ontario are teaching agriculture at the present time, and of these about 600 are conducting school gardens. These gardens vary from 6 or 8 square rods up to one acre. Where the plot is as large as one acre the crop is almost wholly potatoes. Where the plot contains 10 or 20 rods the crop is composed of common vegetables. One of these schools recently sold the crop for \$9.53 and gave the proceeds to the Red Cross. Another garden produced \$26.00. From the best information at my disposal I should

say that on an average, the amount of food produced would reach about \$7.50 per school, for the school gardens alone. This would make at least \$4500.

The schools that do not conduct school gardens are not considered in the above, nor are the home gardens of those pupils attending schools which have a school garden. It is more difficult to get data regarding the home gardens, but it very frequently happens that one pupil at home will grow as much as the whole school garden will produce. If we were, therefore, to consider the increase produced by the pupils in the home gardens we would easily reach the sum of \$40,000.

The school garden produce does not appear large because of the nature of the problem and of the amount of land involved. This problem is educational rather than economic.

## GRATIFYING TOTALS

The poultry effort resulted in the raising of 22,000 chickens of an approved strain of a utility breed. This is the first year of this effort, consequently it is an addition entirely. If these are worth 50 cents each it would mean an increase of \$11,000.

To sum up, it may be safely said that through the efforts of the pupils directed by the teacher, the total increase of foods due to this effort is \$55,500.

The plans for 1918 are to be practically those of this year excepting that they are to be extended. The products from the school gardens can easily be quadrupled.

The home projects are also to be extended, and the amount estimated for 1918, might easily reach a total of \$100,000.

## MANITOBA

BY R. FLETCHER, DEPUTY MINISTER OF EDUCATION

**D**URING 1917 the work of school gardens proceeded upon the lines of last year as a general rule. The only change reported is a tendency to conduct gardening operations as a school project rather than as a number of projects by individual pupils. This is mentioned by two of the inspectors, and another states that there is a noticeable interest in the idea of beautifying the school grounds.

The methods employed to inspire and direct the pupils depend chiefly upon the personality of the teacher. Several of the inspectors speak pointedly of the importance of securing the co-operation of trustees and adult members of boys' and girls' club schemes to give countenance and support to the school garden idea. The motive most frequently mentioned is the patriotic one of aid to war sufferers, Red Cross work, and increasing the food supply. The instinct of ownership is directly appealed to by allotting a separate plot to each individual. The principle of emulation, the competitive instinct, is appealed to in the care of separate plots by individuals. Two inspectors mention the efficacy of the appeal to the principle of ambition, the desire for power, as awakened and rewarded by prizes and monetary returns. One speaks of an interest in nature in general and growing things in particular as furnishing a motive which effectively inspires the school children: the sense of personal pride in the school grounds is spoken of in another report as a powerful spring of action; and still another emphasizes the value

of the school garden work as a "project" which the pupil takes a pleasure in planning and carrying out to a successful conclusion.

The addition to the food supply is a matter of pure conjecture, no statistics having been gathered in a systematic way. Some of the comments made upon this matter may be quoted:

1. "Between 50 and 75 bushels of potatoes were raised in the school gardens in this inspectorate."
2. "The season was unfavorable and the production small."
3. "The amount raised in school gardens was negligible, but that in club gardens considerable."
4. "One school realized \$25 from the sale of vegetables, canned produce and preserves."
5. "Twenty dollars' worth was raised by one school for the Returned Soldiers' Association."
6. "Not more than \$50 worth in this division."
7. "Fifty bushels of potatoes in the school gardens of this inspectorate, also some small quantities of lettuce, carrots, cabbage, corn, turnips and onions."

For the future it is generally expected that the school garden will continue to be an important feature of rural school effort. The boys' and girls' club movement, however, has developed a very great interest in the home garden. Many of the inspectors are of opinion that the school garden will in future tend to become an illustrative teaching agency, a sort of miniature experimental farm serving educational ends, both æsthetic and practical, while the home gardens will engage the spare hour of the pupils in their participation in club and fair projects and contests, all of which will be largely directed from the school.



## SASKATCHEWAN

BY A. W. COCKS, B.Sc., DIRECTOR OF SCHOOL AGRICULTURE

**B**Y means of an article in the February number of *The Saskatchewan Rural Education Monthly* the attention of teachers and pupils in the province was directed to the production and thrift

Canada the boys and girls were preparing to assist in the production of food material by the growing of vegetables in their gardens and a quotation was made from a circular addressed to teachers and pupils of British Columbia asking them to create wealth by the cultivation of their school gardens. It was estimated that if every pupil in Saskatchewan would produce ten dollars' worth of vegetables it would add \$1,000,000 to the value of the wealth produced from the soil of the province.



ENLISTED IN THE PRODUCTION CAMPAIGN,  
WALLACE, SASK.

campaign and to the Dominion Government's appeal to the farmers of Canada for increased production of food stuffs. It was pointed out that the boys and girls could assist in this work and it was suggested that during 1917 school gardens be devoted chiefly to the growing of vegetables. Reference was made to the fact that in 1916 the proceeds from the sale of school garden produce were given, in many cases, to various patriotic funds.

In the March number of the bulletin the subject again received attention, and special reference was made to the circular addressed by the Minister of Education for Ontario to the inspectors and teachers of that province, urging them to arrange to grow plants of food value in the school and home gardens. It was pointed out that in almost all the provinces of

fairs offered special prizes for garden competitions and for classes of vegetables to be exhibited at school fairs and thus



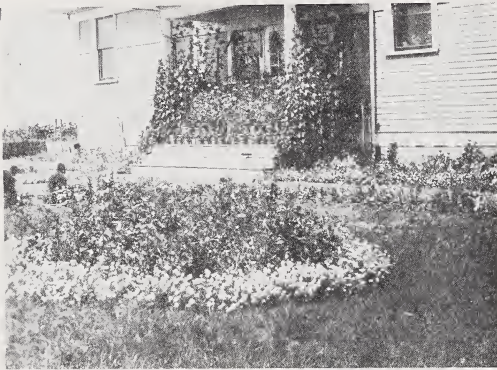
THE POTATO CROP, WALLACE, SASK.

afforded another inducement to the boys and girls to join in this production campaign. The response to this appeal has been very satisfactory. At all of the school fairs, the number of which is approximately twice the

number for 1916, the exhibits of vegetables indicated that a good deal of work had been done in the school and home garden by the boys and girls of the province. After the fair it was quite customary for the ex-

seed potatoes and will sell the seed of the best varieties to the people of the district.

The amount of extra food crop raised by the school pupils of Saskatchewan has been undoubtedly considerable, but owing to the fact that no special report on the school garden is made to the Department it is almost impossible to make any estimate of the actual amount of food material produced by the school pupils of the province.



MAIN ENTRANCE, SOUTH, NORTH REGINA SCHOOL, FIRST  
YEAR, AUGUST 15, 1916

hibits to be sold by auction and the proceeds devoted to the Red Cross Society. Several rural schools specialized in the cultivation of pure seed potatoes. In one case 45 bushels of potatoes were raised and sold and as a result the Red Cross Society benefited to the extent of about \$50. Another school has published its results from experiments with pure

ens, etc., will be organized by rural education associations, agricultural societies and home-makers' clubs.

In 1918 there will be over 200 school fairs during the fall and each of these will encourage the pupils of from ten to a dozen schools to raise foodstuffs, both in the vegetable and animal form.

## NORTHERN SASKATCHEWAN

BY FRED W. BATES, M.Sc., DIRECTOR OF SCHOOL AGRICULTURE

**T**HE campaign for greater production has without doubt resulted in a large increase in the amount of garden produce raised, but I know of no way in which this can be estimated, even approximately. The amount of this increase directly due to the school garden enterprise is still more difficult to determine. One thing is certain, the spirit of the time has helped in the campaign for popularizing the

school garden. Many people can see the value of production to whom the garden as an educational project would make little or no appeal.

Believing the school garden to be the laboratory for the nature study agriculture of the public school we have taken every opportunity both with the teachers and the general public to emphasize it as an essential feature of our school work. We have made no modification in this presen-

tation of the enterprise, and, further than presenting to the teachers through columns of the *Rural Educational Monthly* the general call for greater production, no pressure has been brought to urge greater garden effort. There has been a very definite reason for this attitude. Experience has shown that here in the West, where so many things are done in a large way, the inevitable tendency in the beginning of the garden work to attempt too much, results in much waste through weeds and careless handling of the whole scheme. It seemed unwise, therefore, to urge larger areas of work and so the emphasis has been laid on conservation, with the result I believe that much more has been produced and in addition habits of care and efficient management so much needed in our Canadian life have been developed. The usual method employed in the disposal of the garden

produce has been the auction sale, although in some cases regular customers have been secured. At the majority of the school fairs sales of the children's vegetables and other materials have been held, the proceeds being devoted to some patriotic fund.

The chief modification has come in connection with the home gardens and there has been a very great increase along these lines. The towns and cities have in several instances incorporated the home gardens and the vacant lot movement, and, without doubt, many have been led to begin garden work through the impetus of the home garden project.

For the coming year our motto for the school garden will be "Better gardens and total elimination of waste", for the home gardens, "Better and bigger gardens and conservation of the produce".

## MANITOBA

### BOYS' AND GIRLS' CLUBS

BY J. H. KITELEY, SUPERINTENDENT OF EDUCATION

**P**ROBABLY no phase of Agricultural Extension work has developed so rapidly as the Boys' and Girls' Clubs, and it is now evident that expenditure of both money and energy in this work is accomplishing more gratifying results than if spent in other activities.

The membership in Manitoba is now 15,000. Four years ago it was 750.

The work is carried on in connection with the public schools, and its success is largely due to the unselfish support of the teachers of the province.

In organizing clubs the plan followed is to co-operate with teachers, public school inspectors and prominent business men and farmers. A central club is usually organized at

the natural marketing centres of the district. Its officers consist of an organizer, or general manager, president and secretary. The duty of the central club is to organize and direct the activities of the branch clubs established at each of the rural schools within a radius of from four to twelve miles. The president and secretary of both the central branch clubs are usually selected from the older members of the club.

While the school is the centre, the membership is not confined to the pupils. The older boys and girls of the district are eligible to membership, the age limit being from seven to eighteen.

This year the activities of the clubs are carried on along twelve lines or contests. The approximate



enrolment in the main contest is as follows:—

One-half acre of pure seed growing . .	900
Gardening and canning . . . . .	5,000
Poultry raising . . . . .	2,500
Garment making . . . . .	3,000
Cookery . . . . .	3,000
Pig, calf or colt raising . . . . .	2,000

Besides the above there is a large enrolment in manual training, noxious weeds contest, and the essay writing contest.

The Junior Seed Growers received sufficient wheat, oats, barley, corn or fall rye for a half acre plot. It was stipulated that the work be done

he or she select twenty pounds from their own supply. Improvement in form and quality and yield is aimed at. One pound of peas and one pound of beans were also distributed free to each member in the gardening contest. Altogether 725 bushels of potatoes and 10,325 pounds of peas and beans were distributed. This year we are emphasizing the gardening and canning work of the club. Late spring frost and an exceedingly dry summer have had a disastrous effect on many of our gardens. However, our members are getting some splendid results even under these



BOYS AND CALVES IN THE CALF FEEDING CONTEST AT PORTAGE LA PRAIRIE BOYS' AND GIRLS' CLUB FAIR

entirely by the boy. These plots were inspected by competent men and the boy instructed in the principles of selection. From this half-acre plot the boy or girl selects sufficient heads of the most desirable type for his quarter-acre plot next year.

Besides the prizes given at the local Boys' and Girls' Club Fair, \$150 in prizes will be awarded at the Provincial Seed Fair next fall. The exhibit consists of a half bushel of grain and a sheaf.

#### HOW THE COMPETITIONS ARE OPERATED

In the gardening contest potatoes, peas and beans are the main crop. Ten pounds of potatoes were supplied free to the members on condition that

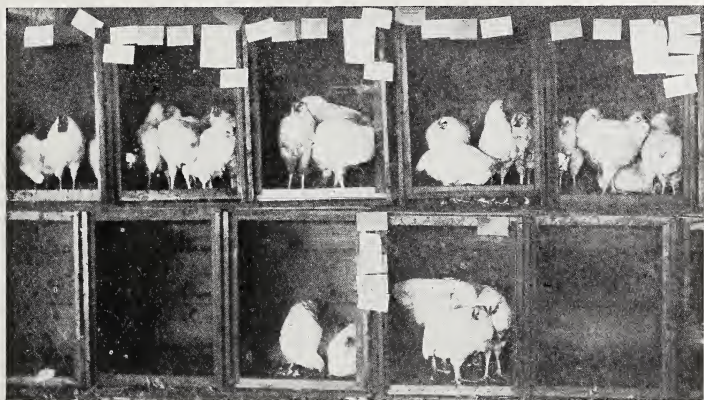
adverse conditions by extra cultivation. Canning demonstrations were given at most of the centres. Practically all of the surplus vegetables are being canned.

A local bank has given able support to the movement, and it is largely due to this interest that so many pigs were in evidence at many of the fairs. The managers frequently lend money to the boys and girls to buy pigs, taking as collateral only the boys' or girls' own note. Last year every note was promptly redeemed on maturity. The boy or girl purchases a pair of young pigs in the spring, has their weights certified by an officer of the club, and then feeds them through the summer, keeping an accurate record of the kinds and amount of feed used. On



the day of the fair the pigs are again weighed, and their records handed to the director of the contest as a guide to the judge in making the awards. The pigs are often sold on the day of the fair, and they readily

established clubs select settings from individuals of their own flock which are of the most desirable type. Anywhere from fifteen to seventy-five exhibit coops of poultry may be seen at the local fairs.



SEVEN PENS OF WHITE WYANDOTTES SHOWN AT PORTAGE LA PRAIRIE BOYS' AND GIRLS' CLUB FAIR. FORTY PENS WERE SHOWN

command the highest market price. The profit is the boy's. It is no longer "Johnny's pig and Daddie's pork."

Poultry raising is a valuable contest, and is resulting in much im-

#### SHORT COURSES IN MANUAL TRAINING

In connection with the manual training work twenty short courses were held during the summer, each



COOKING AND CANNING, PORTAGE LA PRAIRIE BOYS' AND GIRLS' CLUB FAIR

provement among the poultry flocks throughout the province, as well as furnishing valuable training to the members. Pure-bred eggs are supplied to new clubs. Members of

of two weeks' duration. These were conducted by the regular manual training teachers of the province. Such lumber as could be obtained locally (even packing boxes were

sometimes commandeered) and improvised benches were used. The only tools used were those that they could obtain at home. Each boy and girl made from three to six useful articles which would have done credit to a boy working in a fully equipped manual training room.

Nor is the girls' work forgotten. Twenty short courses extending over two weeks each were conducted in cookery and sewing this summer. The exhibits in cooking and sewing at the fairs call forth many an exclamation of surprise both for their number and excellence.

A notable feature of the fairs is the number of prizes won by the girls for poultry, calf and pig raising.

The noxious weed contest is one of the most instructive in the list. A collection of mounted weeds accompanied by a collection of weed seeds in small bottles, neatly mounted, require both knowledge and skill if satisfactory results are to be obtained. A very large exhibit of noxious weeds is anticipated this fall, according to reports from the clubs.

#### BULLETINS CIRCULATED

The following valuable bulletins were prepared and published this spring for the use of club members in their respective contests:—

Seed Growing—Professor T. J. Harrison.

Pig Raising—Professor F. Jacobs.

The Home Garden—W. T. G. Weiner, B.S.A., and J. A. Neilson, B.S.A.

Garment Making—Miss Blackburn.

Canning by the Cold Pack Method—Prof. C. H. Lee and Miss R. M. Atkinson.

About 160 fairs were held between September 1st and October 15th. The Extension Service of the Agricultural College furnished judges for these fairs. Prize cards, judges, books, ribbons, pins, entry tags and envelopes, are also supplied by the Extension Service. Although the fairs are held during a very busy season in Manitoba, the attendance compares favourably with that of the Agricultural Society Fairs.

Beside the local prizes, many well-worth winning special prizes are offered.

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In an article in the *Farmer's Advocate* of November 8th on "The Canadian Boy as a War Helper," Mr. Frank Yeigh, well-known as an author, after quoting examples of the work done on the farm by the veriest lads last summer, writes: "So the interesting human documents run, revealing the mind and purpose of these sons of the Dominion who will make or mar the Canada to be. Reference has been made to the Soldiers of the Soil. It is the alliterative title of a movement of co-operation by the Y.M.C.A., the various Sunday School associations and five of the Protestant denominations, to encourage the boyhood of Canada to assist in farm production, and already responses have come from every province. The S.O.S. initials stand for the wireless call, and the S.O.S. directors have been appointed in local churches and communities to further act co-operatively. In Guelph these agencies worked so effectually that two hundred boys and girls engaged in work on gardens, vacant lots and farms, with crop results in the city alone estimated at a value of \$25,000."

## PART IV

### Special Contributions, Reports of Agricultural Organizations, Publications and Notes

#### VACANT LOT GARDENING

##### A CONSIDERATION OF METHOD AND ACCOMPLISHMENT IN THE CITIES OF THE DOMINION

WHILE the utilization of vacant lots and back-yards for vegetation has received a great impetus this year, the work was only an innovation in the sense that organization was more general and communal interest and activity enlisted in greater measure than previously. To ascertain to what extent these features were brought into existence and to be in a position of helpfulness in suggestion from one community to another, requests for information on the points involved were sent to the secretaries or other officials of the different organizations concerned in cities with a population of 10,000 and over. To publish verbatim all the replies received, often with reports, illustrative and descriptive

literature and other matter, would take a volume of some dimensions. An attempt has, therefore, been made in the following to bring together the main particulars in such a way that if there is any apparent improvement in one or more directions in the methods adopted, either in origin or management, of one centre compared with another, all may have the benefit, thus creating a real communal of interest. In this connection first consideration must naturally be given to details common to all, such as the number of members and the scope of the activities. For this purpose the table that follows has been prepared from the replies that have been received:

PLACE	Organization	No. of Members	No. of Gardens	Total Area	QUANTITY OF CROPS	
					Potatoes	Other Crops
Brandon, Man.	Vacant Lot Association	325	300	25 acres	1,875 bus.	All light
Brantford, Ont.	Thrift League	300	300 new land gardens; 250 revised gardens	40 acres	not estimated	Not known
Calgary, Alta.	Vacant Lots Club	1,113	1,113	220 acres	15,500 bus.	Varied
Edmonton, Alta.	Vacant Lots Garden Club	261	685	100 acres	.....	Varied
Galt, Ont.	Vacant Land Production Association	165	200	45 acres	2,500 to 3,000 bags	Varied
Glace Bay, N.S.	High School Boys	.....	.....	Golf Links	6,000 bus.	.....
Greenfield Park, Que.	Horticultural Society	234	182	75 acres	600 bags	Varied
Guelph, Ont.	No one organization	2,000	1,500 to 1,800	.....	50% of city crops	Varied
Hamilton, Ont.	City Garden Club	250	255	55 acres	2,400 bus.	Varied
Hull, Que.	Individual	.....	Many	30' x 33' each	No record	Varied
London, Ont.	McClary Welfare	.....	100	14 acres	500 bags	Varied
London, Ont.	St. Ry. Potato Synd.	59	1	9 acres	600 bags	.....
Mcneton, N.B.	Public-spirited men and City Council	.....	.....	27 acres	.....	.....



PLACE	Organization	No. of Members	No. of Gardens	Total Area	QUANTITY OF CROPS	
					Pctatoes	Other Crop
North Bay, Ont.	Agricultural Committee of Council		125	12 acres	1,000 bags	
Owen Sound, Ont.	Gardeners' Association	200	200	125 acres	6,500 bags	Varied
Ottawa, Ont.	Vacant Lot Association	260	1,160 and 22 worked en bloc	100 acres	Upwards of 12,000 bus.	Varied, about 10,000 bus.
Ottawa, Ont.	St. Andrews' Church Free Gardens	122	122	15 acres		
Port Arthur, Ont.	Garden Club	525	525 at least	No sure information		Varied
Regina, Sask.	Vacant Lot Garden Association	225	415	30 acres	No definite statistics	Varied
Sault Ste. Marie, Ont.	Patriotic Production Committee			26 acres	Average	Average
Saskatoon, Sask.	Vacant Lot Garden Scheme, Public Health Dept. & Parks Board	600	600	83 acres	8,400 bus.	Varied
St. Thomas, Ont.	Home Gardening Association	100 on large areas	100 on large areas	Large areas, 15 acres Small areas, no record	No record	Varied
St. Lambert, Que.	Horticultural Society	About 150	About 150	140 acres	No record	
Sherbrooke, Que.	Civic Improvement Committee, Board of Trade	350	300	Lets 50 x 100	No record	No record
Stratford, Ont.	Vacant Lot Committee		151			
Toronto, Ont.	Vacant Lots Cultivation Association in Co-operation with the Rotary Club	20 executive members	826	150 acres	4 bags to a lot	Varied
Victoria B.C.	Increased Production Com.		333	120 acres	No record	Varied
Westmount, Que.	City of Westmount	300	300	750,000 sq. ft.	No record	No record
Windsor, Ont.	Resources Committee	Indefinite	700	80 acres	No record	Varied
Winnipeg, Man.	Western Agricultural Society	119	79 home; 150 vacant lots	9 acres	1,150 bus.	Varied

## ORGANIZATION

The foregoing table shows that the organizations having the work in hand were of a varied character. In some places there appears to have been no set organization whatever, the work being undertaken by public-spirited citizens individually. In others existing organizations such as horticultural and agricultural societies and rotary clubs bent their energies to the task. In others again, the city councils and boards of trade bestirred themselves, and in others, yet again, the local branches of the National Service and of the provincial Resources Committee systems shouldered the responsibility. In the West especially, the vacant lot associations and garden clubs, most of which have been running for several years, made special efforts towards extension of areas and increased production. Guelph, it will be seen, leads in both membership and number of gardens, and Calgary in number of acres covered, while

Ottawa, the figures from which city are more definite than in any other case, and Calgary seemingly run each other closely in point of total production. At Guelph, as becomes the city in which stands the Ontario Agricultural College, every local association appears to have made common cause, but, besides Ottawa, Brantford, Port Arthur, Galt, Owen Sound and Windsor stand out prominently in Ontario in proportion to their population. The Ottawa Vacant Lots Association, in conjunction with the free garden system of St. Andrew's church, comes second in number of gardens, and Montreal, taking Westmount and St. Lambert together, second in acres covered. Toronto comes third with 150 acres and Owen Sound fourth with 125 acres. It will be understood that methods of computation, both of space and quantity, probably varied just as the methods of organization appear to have done. The replies received, although the same par-



ticalars were asked of all, also differed greatly. One is herewith quoted because of the spirit it manifests and because it proves that if the West is much to the fore the almost extreme East is not unmindful of its duty. The reply, as will be observed, is from Glace Bay, Cape Breton, and runs as follows:

Although the information here given from the Maritime Provinces is not much in detail, good work was done there, as is proven by the fact that at Halifax, N.S., 270 loads of manure were delivered and 100 lots ploughed. The school children were also supplied with 5,250 packages of flower and vegetable seed.



OTTAWA VACANT LOT GARDENS—A GENEROUS RESPONSE FROM MOTHER EARTH

Glace Bay, Cape Breton,

The centre of the great eastern coal fields, where the sun comes up on Canada.  
Has 17,000 population;  
2,400 boys at the front;  
215 killed;  
6 military crosses;  
7 military medals;  
4 distinguished conduct medals;  
10 promotions from the ranks on the field of honour.

Professor McKinnon with a bunch of high school boys and the financial backing of the Dominion Coal Co., raised 6000 bushels of potatoes on the old golf links.

There was a school exhibition of backyard garden truck at which we had over 2000 entries and had potatoes from 3 lb. 11 ounces down to  $\frac{1}{2}$  lb., cabbages 17 lb., pumpkins 37 lb., and everything else big. The Kids made a marvellous show and are enthusiastic to go bigger next season. National Service has been a success.

(Sgd) STUART McCRAWLEY,

Hon. Sec. Kitchener Club, Glace Bay.

#### THE METHODS EMPLOYED

Following are a few excerpts from the statements received which further explain the methods followed in organization:—

*Guelph.*—Many community agencies united as Soldiers' Sons and Sisters of the Soil and S. O. S. The S. O. S. is formed of boys and girls of the Y. M. C. A. and Sunday Schools.

*Brantford.*—The garden section of the Thrift League divided the city into sections with a chairman for each section. These chairmen organized small committees, the members of which made a personal call on every resident of the district. Where a man had land at his residence that was not being worked he was urged to make use of it. If he had not land of his own, he was asked to work a lot supplied by the Thrift League.

*Galt.*—After a gathering of citizens had

decided to form the Vacant Land Production Association, a series of public meetings were arranged at which the speakers were men who understood gardening in its different phases, such as ploughing, hoeing, planting, seeding and weeding and cultivation.

*Stratford.*—Representatives from the city council, the park board, Horticultural Society, Daughters of the Empire and public school board met and organized a Vacant Lot Cultivation Committee.

*Sherbrooke.*—The road department of the city offered free ploughing and harrowing. The Board of Trade Committee urged the citizens to take hold.

*St. Lambert.*—The town council asked the local horticultural society to undertake

*Hamilton.*—The City Garden Club was the outcome of the co-operation of the city with the Hamilton Horticultural Society.

*St. Catharines.*—The Food Production Association is formed of members of the horticultural society, board of trade and city council.

*London.*—The work was conducted by a committee of the McClary Welfare Association, the Street Railway Company and other agencies.

*Windsor.*—A committee having been formed by personal effort the city undertook to pay all bills for ploughing and advertising. The city also loaned ten teams.

*Owen Sound.*—Committees from the city council, boards of trade, workingmen's clubs,



OTTAWA VACANT LOT GARDEN—"THE WOMAN WITH THE HOE"

the work and the council would arrange for the ploughing and harrowing.

*Ottawa.*—Upon the initiative of the Ottawa Horticultural Society a meeting was held of representative members from the Canadian Club, the Board of Trade, Rotary Club, Trades and Labour Council, Soldiers' Wives League, National Council of Women and other organizations and the Vacant Lot Association formed. On the recommendation of the Glebe Trustees, the congregation of St. Andrew's Presbyterian church, Ottawa, granted permission to use the vacant property owned by the church for free garden plots and a committee was appointed to take the necessary steps to have the land ploughed, harrowed, disced and surveyed into plots.

boards of education and horticultural society got together and formed a Gardeners' Association.

*St. Thomas.*—The executive is composed of representatives from the city council, board of education, board of trade and horticultural society.

*North Bay.*—The city council appointed a committee who enlisted the co-operation of a number of citizens.

*Port Arthur.*—The markets committee of the city council took the initiative. The chairman of the committee accepted the chairmanship of the Garden Club at a public meeting and the superintendent of parks was elected vice-president and the city clerk, secretary.



*Winnipeg.*—Operated under the Manitoba Agricultural Societies Act.

*Regina.*—The Vacant Lot Garden Association is composed of a committee of business and professional men with a chairman and secretary-treasurer.

*Saskatoon.*—Persons desiring to secure a vacant lot for gardening purposes made application at the Public Health Office. The applications were granted in order as they were received.

*Calgary.*—The executive committee of the Vacant Lots Club meets monthly. It is composed of twelve members selected by the cultivators and twelve selected by the city council, the board of trade, the consumers' league, the trade and labour coun-

## SECURING LOTS

The method of securing lots was in many cases similar. The names were procured from the assessors of vacant lots and the owners were approached by circular and in some instances by personal canvass. In one or two cases, as soon as the object in view became apparent, there was a spontaneous offer from owners of lots. Advertising in the newspapers was also resorted to. The churches were approached and the clergy requested to make announcements of



OTTAWA VACANT LOT GARDEN—BEETS, BEANS AND OTHER FOOD CROPS

cil, the horticultural society, the associate charities and other organizations.

*Edmonton.*—Various city organizations elected representatives which constituted the board of directors who met and elected an executive committee. The committee appointed a superintendent who gave up his whole time for four months of the year.

*Victoria.*—A committee of citizens listed lots available for cultivation and allotted them. They ploughed, harrowed and disced the land and bought and sold seed potatoes at cost, 14½ tons being thus disposed of. Many vacant lot back gardens were cultivated, besides those under the control of the committee. The expenditures and receipts balanced at about \$2,200 for the season.

what was going forward from the pulpit. In Ottawa preliminary work was done by a sub-committee of the Horticultural Society, the result being the permission to use large areas. When the work was turned over to the Vacant Lots Association, personal requests to real estate owners were made and a notice given in the press requesting offers of land. The responses were taken into consideration by a special committee who reported on their adaptability. As regards the St. Andrew's Church

system, advertisements in the city papers were inserted and notices from the pulpits requested, announcing that applications would be received for the plots and that the committee would be on the grounds at certain times to make the allotment.

At Stratford, a circular was issued with a coupon to be filled in by those who had available lots and another coupon to be filled in by anyone desiring to cultivate a lot. In the majority of cases the telephone and postal facilities were freely used. Building and land companies gener-

## PLOUGHING AND FERTILIZING

Little fertilizing was done, operations being commenced in many cases too late to permit of this being thought of. In instances the ground had been used for gardens previously and had laid fallow for years. Especially was this the case where real estate agencies had acquired land on the outskirts of cities and towns. Ploughing was frequently undertaken by the city. Where this was not done, a small fee was charged proportionally to the cultivators of the lots. At Halifax, eighty cents per hour was charged for work and from eighty cents to one dollar per load for manure. Special advantages were offered in all the principal cities to returned soldiers and the wives of soldiers. For these in every case ploughing and discing and any other preliminary work with instructions were freely forthcoming. At Westmount, a fair sample of the policy pursued was furnished. The ploughing was done by co-operative labour and charged to the cultivators of lots, except in the case of returned soldiers and soldiers' wives, municipal employees and the Boy Scouts who cultivated for the soldiers and patriotic purposes.

At Ottawa the lots were ploughed by ploughmen hired by the day under direct supervision of a superintendent. Only where the land was very poor was any fertilizer applied, which was obtained from the corporation incinerators, the association paying for the teaming of the manure. A small quantity was also donated by some private citizens. After being ploughed the ground was gone over twice with a disc harrow before being turned over to the plot-holders. The St. Andrew's Church committee made a contract with a farmer to plough, disc and harrow the land, but no fertilizer was used. At Toronto, where the city council made a grant of \$2500, farmers and teams were hired for ploughing and paid from \$6 to



A SOLDIER'S WIFE, WHO CULTIVATED A VACANT LOT IN TORONTO AND PRODUCED \$70 WORTH OF VEGETABLES

ally surrendered their land for the time being. The corporations of different cities also volunteered the use of the land at their disposal. In instances, a small fee was charged of one dollar per lot. This was the case notably in Toronto and Winnipeg. In Calgary a fee of one dollar was charged for the first lot and fifty cents for the second lot, a lot being 3000 square feet.



\$7.50 per day, the total expenditure for this service being \$1,021. Manure was donated by private parties and corporations and \$1 a load was paid for hauling. Guelph is another city that made a grant of money for the purposes of ploughing, but the lot-holders had to do their own fertilizing. At Brantford a fee of \$1 for one-tenth of an acre was charged for ploughing, the city supplying the teams and harrows. Plot-holders had to do their own fertilizing if it was necessary. At St. Catharines the

fertilizer was used, and the cultivators paid for their own ploughing, except in the case of fifteen acres of park property which was ploughed by the city and lot takers assessed in proportion. At Sault Ste. Marie, ploughmen were engaged at \$6 per day, and averaged three-quarters of an acre per day. The actual cost was proportioned among the cultivators. At Port Arthur, the City Council ploughed and harrowed, and charged one dollar for a thirty-three foot lot.



TORONTO VACANT LOT—CULTIVATED BY A ONE-ARMED MAN

committee dug and ploughed the yards of soldiers' wives free of charge and advertised that they would plough eighth of an acre lots on the same terms. Forty people responded.

At Galt, the co-operative system was used for ploughing, and the cost of ploughing and harrowing averaged \$1.50 per lot. Fertilizing was considered necessary in very few cases. The garden charges for work were identical in many cases. At Windsor the teams employed were from the city and cost lot-holders only seventy cents an hour. At Owen Sound, no

At Winnipeg, where the lots were 33 by 100 ft., the city did the ploughing, the cost to the cultivator being covered by the \$1 fee charged in all cases. Manure was supplied free by citizens, the gardeners doing their own fertilizing. At Saskatoon, one dollar was charged for ploughing, discing and harrowing lots with a frontage of twenty-five feet, the work being done by the Parks Board. At Victoria, B.C., the city ploughed the lots and sold manure at sixty cents a cartload. The statement received says, "We are plough-

ing and selling manure this fall in preparation for next season. We did not break even at \$2.25 per lot this year, for ploughing, discing and harrowing, the cost being about 2.80. Next year we shall charge \$1.75 for ploughing, 75c for discing, and 50c for harrowing.

### PLAN OF ALLOTMENT

Except as regards the sizes of lots, which differed considerably, the plan of allotment was very similar all over. Applications were registered and accorded choice of lots in the order

preference, the lots being free, while others paid \$1 for the year's privilege.

The sizes of lots depended to a large extent upon the number of applicants and the area of land available. At Sherbrooke, Que., the lots were 50 by 200 ft. each, at Ottawa 25 by 100 ft., and St. Catherines one-eighth of an acre. At Owen Sound the city's 15 acres were apportioned into lots of 6000 square feet each. At Regina, Sask., the land was divided into lots 25 by 125 ft., and \$2 charged per lot, which covered the ploughing. An office is



FIRST PRIZE COLLECTION OF VEGETABLES, GROWN ON VACANT LOTS AT TORONTO BY C. HONEYMAN, WHO ALSO WON 11 FIRSTS, 5 SECONDS, 2 THIRDS AND 1 FOURTH

received. At Westmount, Quebec, large sections were granted to municipal employees, members of the Khaki League and Boy Scouts, and small sections to individual cultivators. Efforts were generally made to give applicants lots near their own home, and where groups were formed, as in Ottawa, the lots were allocated as nearly as possible together. Plots were sometimes numbered and distinguished by sign boards. At London, Ont., the lots were numbered, the numbers placed in a box and drawn for by the applicants. At Toronto and elsewhere, soldiers and soldiers' dependents were given the

opened in the spring for registration and reception of fees. In Saskatoon applicants were required to sign a promise to cultivate.

The Secretary of the Resources Committee at Windsor, after advertising that lots would be ploughed, disced and harrowed for people undertaking to cultivate them, distributed circulars with Government advertisements on one side directing attention to the seriousness of the situation, and, on the other side, giving diagrams of gardens and advice on what to plant and details of food values. These circulars were sent to the school teachers, who had them neatly folded



and put into every house in the city, pupils taking different streets.

### THE SECURING OF SEED

Halifax, Sherbrooke, Toronto, Brantford, Galt, Windsor, Owen Sound, Edmonton and Victoria made arrangements with local merchants to sell seed at cost to cultivators under the scheme. St Lambert, Westmount, Hull, St. Catherines, Stratford, Greenfield Park, Winnipeg, Brandon, Regina and Saskatoon allowed lot-owners to purchase seed at their own

tomato and celery plants free, acting under the advice of the District Representative. At Port Arthur the city bought 243 bags of potatoes and sold at cost. At Ottawa the matter of seed was largely left to the plot-holders with the exception of potatoes, of which the association secured 200 bags at wholesale prices and sold at the same figure to plot-holders, one bag to each man. At Owen Sound the association secured 200 bags of potatoes and the city 400 bags and sold them at cost.



GALT LOT GARDENERS IN POTATO PLOTS

option. At Hamilton the city bought seed potatoes and sold them at cost and the Horticultural Society gave seeds as premiums. At Guelph, the Y.M.C.A. Production Club provided seed potatoes at cost. At London, the Welfare Association bought a carload of potatoes and sold them at cost. They also purchased Paris green and small hand sprayers. At St. Thomas the Board of Trade bought a carload of potatoes and sold them at cost. At North Bay the Committee did the same thing. At Sault Ste. Marie the committee guaranteed seed potatoes at \$3 a bag, and supplied cabbage, cauliflower,

### CULTIVATION, SPRAYING, ETC.

In the majority of cases the land having been once allotted, to the holders were entrusted the entire operations. In one or two cases, provision was made that if the lots were not properly cultivated, they would have to be surrendered. At Ottawa, in the few cases where a group of lot-holders wished to work jointly, the association did some extra cultivation at apportioned expense. Several had manure put on the plots, but the majority used the land as it was. Practically all land loaned to the association was sod.

Except in cases where couch grass was very bad, the work done by this association, followed by faithful work on the part of the plot holders, secured very excellent results. The spraying was also done by the plot-holders, and only on a very few scattered plots was there any damage to the crop from insects. In Toronto, the Executive of the Vacant Lot Association ploughed the manure in where required and provided sprayers, and lot-holders did their own spraying. All the cultivation had to be done to the satisfaction of the superintendent. As at Ottawa, so at Stratford, the Committee used the local papers for articles on cultivation. At Guelph, lots were to be confiscated if not looked after or seeded by date in agreement. Only two lots out of 1600 had to be given up.

### AWARDS AND PRIZES

Despite the fact that one correspondent, replying to a question as to whether special encouragement by means of awards and prizes was given says, "Don't believe in it; results ought to be our reward," at by far the larger majority of places heard from such encouragement was held out. In some instances special exhibitions were held at which the awards were made. In other cases the products were judged and decisions rendered at the regular annual exhibitions of the horticultural and agricultural societies, or at the district fall and school fairs. Samples of what was done in this direction are herewith given:—

*Greenfield Park, Que.*—Special prizes for best gardens, flower and vegetable, separate and combined; special prizes for first-year gardens; exhibits made at annual exhibition and children's competitions held.

*St. Lambert.*—Three prizes given by the horticultural society.

*Westmount.*—Prizes for best gardens and best produce at annual exhibition.

*Ottawa.*—By the desire of subscribers to the funds the management committee set apart \$300 to be distributed in prizes. Three groups were formed, western, cen-

tral and eastern. These groups were divided into two classes, one for plots growing a general crop and one in which two-thirds or more of the plot were in potatoes. Six prizes were given and six certificates awarded in each class. In the potato class the prizes ran from \$10 to \$1 and, in the general class, from \$15 to \$1.

*St. Andrew's Church, Ottawa.*—The plots were judged three times by an expert from the Experimental Farm and certificates of merit awarded.

*Toronto.*—Prizes were awarded at the Canadian National, horticultural society and other exhibitions, special and otherwise.

*Hamilton.*—One hundred and thirty dollars was distributed, principally by the horticultural society.



A SOLDIER'S GARDEN AT GALT, ONT.

*St. Catharines.*—Colonel Leonard gave prizes for the best kept garden and best potato plot.

*Guelph.*—To boys and girls, buttons were distributed according to the value of the crop, one girl raising \$70 worth; two hundred secured these buttons. Certificates and ribbons were given to members of the Home Garden Club and other societies; 60% of the cultivators securing these awards.

*Brantford.*—Prizes were awarded by city sub-divisions.

*Galt.*—Thirty-three prizes and a special prize of a silver medal were awarded, first, second and third being given in each ward, and first, second and third for ladies who undertook to work a vacant lot. Other prizes were given for lots situated on unpromising land. The prizes were presented at the horticultural show and at the fall fair, where tables were set aside for the use of vacant lot holders. A returned soldier and a gentleman over eighty years of age each secured a number of prizes. Photographs were taken of all the prize winners.

*Stratford.*—Prizes open to all amateur gardeners in the city of \$20, \$15 and \$10 and three of \$5 each were awarded at the



vegetable show held at the end of the season. The prizes were donated by citizens.

*London.*—Three prizes for best kept lots, first \$3, second \$2, and third \$1. A vegetable show was held at which three prizes for the best peck of potatoes were given, viz., \$3, \$2 and \$1, and three prizes for the best collection of vegetables, also of \$3, \$2 and \$1.

*Windsor.*—The Board of Education furnished prizes for children. A \$5 prize was donated for each of the four wards by members of the resources committee.

*Owen Sound.*—Six prizes were given for gardens and the park property. First and second for the best plot of potatoes, first and second for the best plot of white beans and first and second for general culture.

*North Bay.*—Prizes awarded according to score kept in three times judging during the season. Prizes were also awarded at the

*Victoria.*—Prizes amounting to \$275 for the best kept gardens and \$80 at fall fair for vegetable exhibits.

## THE CROPS RAISED

In many cases no returns of quantities of crops raised were made and no records kept. Where anything definite was stated the information thus conveyed will be found in the table given in the forepart of this article. Further details that have been furnished by the correspondents will be found interesting and encouraging. At Greenfield Park, Que., the 600 bags of potatoes raised were mostly Green Mountain, while the other crops produced were: 2500



AN EXHIBIT OF VACANT LOT PRODUCE AT LONDON, ONTARIO

fall exhibition in two sections, juvenile and adult.

*Port Arthur.*—The city council gave prizes for the best cultivated gardens of \$20, \$15 and \$10 and six others of \$5 each. Additional prizes were given to soldiers' wives of \$12, \$8 and \$5.

*Winnipeg.*—Garden competitions: Home —(1) lawns, (2) flower gardens, (3) vegetable gardens, (4) best all round gardens, (5) flower gardens, (6) vegetable gardens, (7) best all round gardens; 2-3-4 on lots of from 25 to 33 feet frontage; 5-6-7 lots over 33 feet. Vacant lot competition for gardens on land broken spring 1917, three prizes in all but 4 and 7. Special prizes were given for the patch kept free of bugs.

*Calgary.*—Prizes amounting to \$200 for the best gardens or cultivated land and for the best products, divided into 13 classes.

*Edmonton.*—Prizes given by the horticultural society.

head cabbage, 400 bags onions, 125 bushels green peas, 300 bushels beans (various), 300 bushels tomatoes, 285 bushels turnips (various), 150 bushels parsnips, 500 lb. strawberries, 75 gals. blackberries, 50 gals. red berries and an average crop of other vegetables and fruits, parsley and sage, etc. At Ottawa the 10,000 bushels of crops raised, in addition to the 12,000 bushels of potatoes, consisted of beans, beets, cabbage, carrots, corn, lettuce, onions, parsnips, peas, pumpkins, radish, squash, tomatoes and turnips. At Toronto the averages to a lot ran: potatoes, 4 bags; onions, carrots and parsnips each 3 bushels; beets, 4 bushels; swedes, 5

bushels; beans, 2 bushels; peas, 1½ bushels; cabbage, 30 heads. Lettuce, chard, celery, cauliflower, Brussels sprouts and other garden stuff were also raised.

While reports from the West are to the effect that the dry season had a modifying effect on the vegetable crops, places so far apart as St. Catherines, Ont., and Sherbrooke, Que., report potatoes to have been a partial failure owing to the wet



A McCLARY WELFARE GARDEN AT LONDON, ONT.

weather. At the same time it is worthy of note that St. Catherines reports an absence of interest in the vacant lot cultivation campaign owing to the general prosperity. The statement received from Guelph says that the operating societies raised 50 per cent of the city's potatoes, and almost every other crop was of good quality. An estimate of values reads: 3200 houses, at least 1500 gardens, producing average \$10, total \$15,000; 100 acres in vacant lot cultivation, very conservative estimate \$100 per acre, \$10,000. While giving no definite particulars St. Thomas and other places report excellent results.

## MARKETING AND STORING

In few instances were any arrangements made for marketing surplus crops. In fact there appears to have been little left over when the growers had reaped and garnered what they needed for their own consumption. Guelph, however, operated an amateur garden market. Literature was circulated and instructions given on canning, and if there were any surpluses left over, it remained with the individual to dispose of them. At Saskatoon the City Parks Board erected a root house and invited parties requiring space to make application, a charge of 3c a bushel being made to pay for a man's services during the winter. By the end of October 4000 to 6000 bushels of potatoes had been stored. At Calgary, the Vacant Lots Club possesses a storage warehouse with a capacity of 50,000 tons. At Ottawa, the Women's Canadian Club undertook to dispose of any surplus and succeeded in realizing a considerable sum which was

devoted to patriotic purposes. At Toronto, it was calculated that the produce of each of the 800 lots was worth \$43 and that the cost of production was \$5.25. In some instances lot-holders are said to have sold their produce for \$100.

## METHODS OF PUBLICITY

There is one point on which all the responses to the questions asked agree, namely, in the generosity of the press in gratuitously printing notices, publishing special articles on gardening and vegetable cultivation and giving editorial encouragement. This aid to the movement was unanimous in all the cities and towns. Circulars and pamphlets were very generally distributed, and

the co-operation of the churches was most freely extended. Sherbrooke, Que., adopted the rather novel method of sending out leaflets along with the electric light and water bills. In Ottawa a standard application blank was carried by the daily newspapers for a couple of weeks, assisting materially in attracting applicants. A circular letter widely distributed, stating the object sought and soliciting funds, was almost resultless. Placards in street-cars and in the principal stores proved good advertising. The Thrift League of Brantford paid for some advertising from funds derived by the conservation of waste, in the sale of paper, rags, etc. The schools were used to a general extent for the distribution of encouraging and instructive literature. Public meetings and lectures were invariably resorted to. At Port Arthur the Park Superintendent prepared a blueprint plan showing a model garden.

strators were present, one doing the actual work of preparing the ground and sowing the seeds, the other giving a short talk and answering questions. There is no doubt that the beginners secured much valuable aid in this way, as well as from the superintendent who gave as much of his time as possible to instructing. In the Glebe vacant lots a few locations were let to expert gardeners, who in return gave assistance to beginners. Mr.



A VACANT LOT GARDEN AT THE "FOREST CITY"

## INSTRUCTION TO BEGINNERS

Where possible the services of experts from Government farms were used to give advice and counsel to beginners. Lectures were frequently held and demonstrations made. The Superintendent of Parks in each city was also called upon to render his services. In every case all of these services were free. In the case of the boys and girls, school teacher were called upon to interest the pupils as much as possible in garden cultivation. A fair example of what was done in the majority of cases is afforded by Ottawa. Early in the season demonstrations were held on three successive afternoons in three different parts of the city. These were well attended and two demon-

W. T. Macoun, Dominion Horticulturist, rendered valuable service with expert advice. Government literature, both federal and provincial, was also very generally relied upon. The newspapers rendered admirable service by publishing articles on different appropriate subjects. At Brantford, for instance, each daily paper ran a page every week devoted to beginners' questions. At Winnipeg and other places weekly meetings for consultation and instruction were held.

## TRESPASSING AND PILFERING

Against trespassing and pilfering notices in the press and the ordinary police system were usually relied



upon for protection, and generally proved efficient and sufficient. Many places report no complaints whatever. Ottawa had considerable trouble with trespassers at the start, but notices in the press, two arrests and stiff fines had the necessary salutary effect. Pilfering of light stuff was far too common, and night patrols had to be established, the plot-holders grouping together and taking turn about. However, the amount stolen was a very small percentage of the crop. Toronto reports little trespassing and little pilfering. Three convictions were had and were severely dealt with. Signboards were erected on every lot and special instructions given to the police. Guelph offered a reward of \$25 for the conviction of offenders, but there is no record of its having to be paid. Brantford had a dozen complaints to deal with, but a couple of examples in punishment had the desired effect. It is worth while noting that Halifax, Sherbrooke, Greenfield Park, St. Lambert, Westmount, Hull, Hamilton, Galt, London, Winnipeg and Saskatoon report no trespassing and no pilfering. St. Catherines, Guelph, Stratford, Windsor, Owen Sound, St. Thomas, North Bay, Sault Ste. Marie, Port Arthur, Regina, Edmonton and Victoria record that there was little of either offence. It is impossible to avoid saying that the reports generally show a high standard of public morality.

#### RECOMMENDATIONS TO OTHER ASSOCIATIONS

To a suggestion that associations might advise each other by counsel arising from their experience, a number of replies were received. The chairman of the Halifax association, for instance, says, "Don't multiply organizations; work along lines of least resistance and secure as much as possible co-ordination and co-operation." Greenfield Park suggests that its own example as outlined by this article be generally

followed. The business of the year was concluded with a resolution for a more determined and vigorous campaign in 1918. Toronto would like to see a meeting of secretaries at some central point during the winter for general consultation. Hamilton says, "Start in fall of previous year, engage one man to secure plots, supervise, instruct and attend to allotting of plots, fertilize wherever possible." The secretary for Guelph who is also secretary for the Y.M.C.A. says, "Greatest co-operation can be secured by a very small executive of well-known and tactful men who can inspire others to effort. These should not create a new society, but should enlist the co-operation of all agencies in the community. In case of younger boys and girls, a badge of recognition should be worn. A national badge would be even better." Galt recommends a small energetic council composed of a chairman, secretary and one other who would devote as much time as possible to more and better production and encourage beginners to keep their lots in the best possible shape. Stratford found that having a number of lots grouped together was the best plan, mutual helpfulness and a hearty rivalry working wonders.

Windsor's secretary suggests that it might be more economical to plough areas in several parts of the city rather than vacant lots, then sub-divide them. This, it is suggested, would save in ploughing and preparation. Fertilization would be easier. Rivalry would follow, and protection would be afforded by a community of interest. In addition an instructor could be more conveniently used. The City Clerk of Port Arthur says, "Get a few enthusiastic members to keep the meetings lively. Our fair was a great encouragement, and while the club will cost about \$700, the council says it has been the best spent money for many a year." Winnipeg says, "Organize in December or January, make up prize lists as early as possi-



ble in the year, hold public meetings for lectures and to carry on business at least once a month, offer good prizes and keep the organization before the people all the time." Brandon suggests there should be a national organization and co-operation for products by marketing, preserving, canning, pickling and formation of new industries, and some legislation enabling the use of vacant lands. Saskatoon would like to see ploughing and preparation for vacant lot

gardening done in the fall of the preceding year. Calgary says, "Get every person interested in the work. Have the wealthy people do actual work, and others will soon follow and the movement become popular." At Edmonton plans are on foot for the city to co-operate with the horticultural society with a view to the employment of a man for the whole year. There are twenty-three school gardens in Edmonton. The pupils chiefly cultivate potatoes.

## ACTS RELATING TO AGRICULTURE

### DRAINAGE IN ALL ITS PHASES

The following is a continuation of the article commenced in the November number of *THE GAZETTE*, when the legislation was reviewed relating to drainage in the Maritime Provinces and Quebec:

#### FIVE ACTS IN ONTARIO

Ontario has no fewer than five acts referring to drainage. These are: The Tile, Stone and Timber Drainage Act, The Municipal Drainage Act, The Ditches and Water Courses Act, The Municipal Drainage Aid Act, and The Provincial Aid to Drainage Act.

##### TILE, STONE AND TIMBER

The Act respecting Tile, Stone and Timber Drainage Debentures, which supersedes The Tile Drainage Act of the Revised Statutes of 1897, was passed by the provincial legislature in 1909 and amended in 1914, 1916 and 1917. It authorizes any municipality to issue debentures to an extent not exceeding \$100,000, and not less than \$2,000, bearing interest at the rate of 5 per cent, to be discharged within 10 or 20 years, for the purpose of loaning, at the same rate of interest, sums of one or more hundreds of dollars to owners of land in the municipality for the purpose of tile, stone, or timber drainage, the loan to be repaid in annual instalments covering ten or twenty years according to agreement. The debentures have to be made payable to the Treasurer of the province and must have coupons attached thereto calling for equal annual amounts of principal and interest. Not more than \$1000 can be lent to one person. Applications are to be considered in the order they are made. An inspector of drainage has to be appointed by the council, who will be responsible for the undertaking and report details as to the work required,

progress as made and any other information the council may desire. Authority for the work must be obtained through by-law and repayments can be collected by the same process as taxes. A borrower can make settlement in full at any time on adding 5 per cent to the amount due. A council borrowing money must make a full return to the Provincial Secretary, on or before the 15th January, of the amount expended in drainage, the number of rods of drain constructed, the names of the borrowers, particulars of the land upon which money has been lent, the names of persons whose applications have been refused, and the reasons for refusal, the report to cover the past year's operations up to December 31st. The repayments called for in the Act have to be remitted by the council to the provincial Treasurer within a month after the same became payable. Any delay causes the rate of interest to be raised during the time of the delay to 7 per cent. Any treasurer or officer of a municipality violating any provision of the Act becomes personally liable.

##### THE MUNICIPAL DRAINAGE ACT

The Municipal Drainage Act comprises 119 clauses. It provides that on the petition of a majority in the number of resident and non-resident persons, exclusive of farmers' sons not actual owners, the council of a municipality may appoint an engineer or an Ontario Land Surveyor to report upon the feasibility, the desirability and the cost of the work petitioned for, along with specifications. The Act specifically

applies to every case where the drainage work can only be effectually executed by embanking, pumping, or other mechanical operation, but in every such case the municipal council cannot proceed except upon the petition of at least two-thirds of the owners of land within the area described. If the water overflows on lands in another municipality recompense for any injury caused, or for any repair work required, is to be charged back to the owners of land in the drainage area. Any use of the outlet is to be paid for by assessment. The engineer or surveyor, in assessing the lands to be benefitted, need not confine his assessment to the part of the lot actually affected, but he shall nevertheless in his report show the approximate number of acres contained in the part affected by his assessment. Bridges and culverts that are necessary are to be charged in the work, but a municipality may pass a by-law for the purpose of assuming as a charge on the general funds of the municipality the whole or a portion of the construction and maintenance of all bridges and culverts rendered necessary by any drainage work crossing public highways. Provision is also to be made for the construction and enlargement of bridges rendered necessary, to be charged to the work but to be maintained by the owners. Allowance is to be made for any private ditch or drain or land that may be of value to the drainage work carried on under the Act. Any owner dissatisfied with the report of the engineer is at liberty to appeal to the referee appointed by the Lieutenant-Governor in Council for the purpose of administering the drainage laws. Immediately upon the filing of the engineer's report the clerk of the municipality is to notify the parties assessed of the assessment and the amount thereof. The engineer must file his report within six months of the filing of the petition. If he fails in this respect he forfeits all claim to compensation. Obstruction to the engineer in his work brings a penalty not exceeding \$100. The engineer can report in favour of covering a drain, but provision must be made for all the surface water from lands and roads draining naturally towards and into it. The engineer must determine whether the drainage work shall be constructed and maintained solely at the expense of the municipality employing him or at the expense of other municipalities interested and in what proportion. If the council think fit, it can have the engineer's bill of costs audited by the County Judge. When the council has decided upon carrying out the work it can pass a by-law authorizing it to borrow the funds necessary on the credit of the municipality, or to issue debentures in sums of not less than \$50 each and payable within 20 years, except in case of pumping and embanking drainage work, when the debentures can be made payable within

30 years, at not less than 4 per cent per annum. The by-law is also to provide for the levying of assessments in the same manner as taxes are levied. The by-law must be published once every week for four consecutive weeks in a local or county newspaper, along with the date that the court of revision will meet, and notifying anybody desiring to have the by-law quashed that he must, not later than ten days after the final passing of the by-law, serve upon the reeve or clerk of the municipality a notice of his intention to do so during the ensuing six weeks. The publisher is to be furnished with a list of the names and addresses of all persons within the municipality who are assessed, and is to make and file with the clerk a statutory declaration that each person has had mailed to him a copy of the first two issues of the paper containing the by-law. Instead of publishing in a newspaper the council may, by resolution, cause a copy of the by-law with the notices to be served upon each of the owners. If any are absent then a copy is to be sent by registered letter to the last known post office address of the absentee. If no notice is served of application to quash, or if such application has been unsuccessful, then the by-law is valid. A court of revision for purposes of the Act consists of five persons, three being a quorum. Evidence is to be taken under oath and any person having been tendered the proper witness fees, which are those of the Division Court, who fails to attend, incurs a penalty of \$20 with costs, recoverable by anybody suing for the same. Appeal from the court of revision can be made to the County Judge. In lieu of the interest on debentures being made payable annually it may be added to the debentures. Any owner of lands assessed, or the municipality, may pay the amount of the assessment, less the interest, before the debentures are issued. An irregularity in the by-law does not invalidate the debentures. A drainage work is not deemed to be continued into another municipality merely by reason of such drainage work, or some part thereof, being constructed on a road allowance forming a boundary line. An engineer, if necessary, may continue drainage work into an adjoining municipality and assess land owners benefiting thereby. In that case the council of the initiating municipality shall serve the other municipality or municipalities with a copy of the engineer's report, plans, specifications, assessments and estimates. The municipality so served must raise and pay over within four months from such service the sum received as its proportion of the drainage work, or, in the event of an appeal, the sum determined upon by the referee or Divisional Court. The municipality can appeal within six weeks of receiving the service. The municipality or municipalities through which the drain-

age work extends are responsible for maintenance of the same. If for the better maintenance of work constructed under this Act, or to prevent drainage to any lands or roads, it is deemed expedient to change the course of the work, or to make a new outlet, or to construct a tile drain under the bed of the work as ancillary thereto, or otherwise to improve, extend or alter the work, or cover the whole or any part of it, the council may proceed on the report of an engineer or surveyor without any petition being filed. The cost of such repair work if not provided for in the general funds can be assessed and collected in the same manner as the funds for construction. Municipalities can be compelled by mandamus from the referee to execute repairs. Councils can pass by-laws requiring owners to clean out a drain and keep the same free from obstructions. In case an owner neglects to do this the council can order the work done and charge the same, plus 10 per cent, against the owner in default. Any person obstructing or injuring any drainage work incurs a penalty of not less than \$5, nor more than \$100, and is liable to imprisonment for any term not exceeding six months, and, in default of payment, to a further term of imprisonment not exceeding three months. For the better maintenance of drainage work by embanking, pumping or other mechanical operation the council of the municipality initiating the work may, upon petition from two-thirds of the resident owners of a drainage territory, pass a by-law appointing a commissioner or commissioners to take charge with power to let contracts and do all that is necessary to carry on the work. Also upon the petition of two-thirds of the persons interested in any drainage work constructed by embanking, pumping or other mechanical operations, the council of the municipality in which the work is situated may assume and operate the same. A council can further assume on petition of a majority of the owners any drain constructed under The Ditches and Water-courses Act. Referees are to be appointed by the Lieutenant-Governor in Council, one for the counties of Stormont, Dundas and Glengarry, Prescott and Russell, Leeds and Grenville, Frontenac, Lennox and Addington, Prince Edward, Hastings, Northumberland and Durham, Victoria, Haliburton, Peterboro, Renfrew, Lanark and Carleton, and one for all the other counties in Ontario, at a salary not exceeding \$3,500 a year, together with reasonable travelling expenses. If one referee is absent the other has jurisdiction over the whole province. The referee has the powers of an Official Referee under The Judicature Act and the Arbitration Act and of arbitrators under any enactment relating to drainage work. In respect to all applications and proceedings before him, or which may come before him under

the provisions of this Act, or any former Act relating to drainage works, he has the powers of a judge of the Supreme Court, including the production of books and papers, the amendment of notices of appeal and of notices of claims for compensation or damages and of all other notices of proceedings. His decision, however, except in cases where the Act declares his judgment is final, are subject to appeal. From Section 103 to Section 116 the Act is devoted to the duties and jurisdiction of the referee and the last three sections deal with rules of court and tariff of costs.

#### DITCHES AND WATER-COURSES

The Ditches and Water-courses Act,<sup>12</sup> Geo. V., C. 74, according to section 2, does not affect the Acts relating to municipal or Government drainage work. A ditch is defined as meaning and including a drain opened or covered, wholly or in part, and whether or not in the channel of a natural stream, creek or watercourse, and also the work and material necessary for bridges, culverts, catch-basins and guards. The Act applies among other land to land for mining or manufacturing purposes. The council of every municipality is required to pass a by-law appointing a civil engineer, Ontario land surveyor or other competent person to carry out the provisions of the Act. The clerk of a municipality is to be paid for services performed by him in relation to the Act. No ditch, the whole cost of which, according to the estimate of the engineer or according to agreement, will exceed \$1,500 can be constructed under the Act. Every ditch constructed must be continued to a sufficient outlet, but must not pass through or into more than seven original township lots, unless the council of a municipality, upon the petition of a majority of the owners of the land affected, passes a resolution authorizing the extension. The land, the owners of which may be liable for the construction of a ditch, is that lying within one hundred and fifty rods from the sides and point of commencement of the ditch. The owner of land who requires the construction of a ditch, before filing his application with the clerk of the municipality, must in writing call a meeting of owners interested to consider the particulars. Notice must be given twelve clear days in advance of the meeting. Appeal against the proceedings can only be made on the ground that the person initiating them is not an owner. This appeal must be made within five clear days of the service of notice of meeting. If everybody is agreed the agreement must be signed in set form by every owner of land affected and within six days of the signing must be filed with the clerk of the municipality. If the ditch goes into more than one municipality the agreement must be in as many



parts as there are municipalities and a part filed with the clerk of each municipality. If all the owners have not been duly served with a notice of meeting the owners present on the day appointed may adjourn the meeting. If an agreement is not reached at the meeting, or within five days thereafter, the owner requiring the ditch can file a set requisition naming the several parcels of land that will be affected and the respective owners thereof, and requesting that the engineer appoint a time and place in the locality when he will attend and make an examination. If an occupant having been himself notified, fails to immediately notify the owner of the land of the proceedings that are being taken, he becomes personally liable for any damages that may result. If the engineer is convinced that the land of persons who have not received notice will be affected he is required to adjourn the proceedings until the law has been complied with in that respect. If the ditch proves to be a requirement, the engineer must within thirty days of his first attendance make his award in writing. Any person interfering or obstructing the engineer or assistant in his work is liable to a fine not exceeding \$100. Where rock cutting or blasting is necessary, and the engineer is of opinion that it could be better done by contract than by the owners, he may in his award direct that it shall be so done and apportion the cost to each of the several owners. If the engineer is of the opinion that the owner of any land through which the ditch runs is not benefited thereby he may relieve such owner from performing any part of the work and place it upon the other owners. Any owner affected by the award may within 15 days of the last notice of filing appeal therefrom to the County Judge. The clerk of the municipality must be served with notice of the appeal together with the particulars. The judge may order that the costs of the appeal shall be deposited before trial. An appellant can have the land inspected by any person he may choose. If the engineer is proven to have unduly favoured anyone he may be deprived of all fees. The judge is entitled to five dollars a day and travelling expenses for holding court to hear the appeal. The corporation is to defray all costs incurred within ten days of adjudgment of the case and repayment is to be made forthwith to the treasurer of the municipality by the parties concerned according to assessment. If any owner defaults 7 per cent is to be added to the amount charged against him and to be collected in the same manner as taxes. Any other municipality must pay a share of the costs to the municipality of origin and collect from the owners within its boundaries whose land is affected. The engineer if he finds the work not carried out according to his award, can take it over and let it out

to the lowest bidder. If the party concerned fails on notice to pay for the work done 7 per cent is to be added and the amount placed upon the tax collector's roll. If any owner desires to make use of the ditch for draining land other than that originally contemplated he can avail himself of the provisions of the Act. The Act applies to the deepening, widening and covering, of any ditch already or subsequently constructed. Ditches constructed or changed under the Act are to be maintained by the respective owners. Any failure to do this can be complained of by another owner, and the engineer within 30 days, if the notice is disregarded, can cause the work to be done and charged against the owner in neglect. An owner interested in any other ditch not constructed under this Act, but under another Act, can take proceedings under this Act for improvement of the same. At the expiration of two years after the completion of a ditch, whether constructed under this or any other Act, an owner can take proceedings for reconsideration of the agreement or award under which the construction took place. If a ditch proves insufficient for the purposes for which it was constructed any party to the agreement or award can, after six months have elapsed from its completion, take proceedings for reconsideration. An engineer neglecting for 30 days to make an inspection asked for, incurs a penalty of not less than \$5 nor more than \$10. Councils must keep printed copies of all the forms required by the Act.

#### THE MUNICIPAL AID ACT

The Municipal Drainage Aid Act, assented to in 1909, provides that the council of a township, having passed a by-law for work under The Municipal Drainage Act, may, at the termination of the time limited for serving notice of intention to make application to quash the by-law, apply to the Provincial Treasurer for the purchase by the province of the debentures authorized thereby. The Treasurer is to investigate the proposition and report to the Lieutenant-Governor in Council. The Treasurer must not certify to the propriety of the investment where the aggregate amount of the rates necessary for the expenses of the municipality for the last completed financial year exceeds three cents in the dollar on the value of the ratable property within its jurisdiction, or where the amount of the debentures to be issued exceeds \$60,000. The amount invested in the purchase of the debentures of any municipality must not be more than \$20,000, and the sums so invested by the province must not at any time exceed \$500,000 in the aggregate. The Lieutenant-Governor in Council may authorize the advance of the whole par value of the

debentures, or the retention of a percentage until the Minister of Public Works has reported that the work has been completed and inspected. The debentures cannot be questioned in any court. The amount payable in each year for principal and interest is to be remitted to the Provincial Treasurer within one month after becoming payable. Payments that are due and not settled at that time become subject to interest at the rate of 7 per cent per annum. If the default continues the council is to assess and levy on the whole ratable property within the municipality a sum over and above the other valid debts of the corporation falling due within the year sufficient to meet the liability. The amount in arrear and the interest is to be the first charge upon all the funds of the municipality other than sinking funds. The treasurer of the municipality is forbidden to pay out any money, except for salaries and ordinary current disbursements and for debts due to the province, until the amount in arrear shall have been paid with interest to the Provincial Treasurer. If the treasurer of the municipality disobeys this injunction, or any of the provisions of the Act that come within his province, he becomes personally liable for the full amount in arrear with interest.

#### THE PROVINCIAL AID ACT

The Provincial Aid to Drainage Act was passed by the Legislature in 1911. The Act applies to the portion of the trunk channel constituting the outlet of any drainage work, any work for the purpose of carrying a drainage work through intervening high land to a natural or other outlet and any work for the purpose of rendering more effective a drainage work by embanking, pumping or other mechanical means. The council of a municipality may, after adopting the engineer's report, apply to the Lieutenant-Governor in Council for aid, at the same time setting forth the reasons why the whole cost of the work should not be assessed upon the land which would be liable to assessment under The Municipal Drainage Act, at the same time supplying a verified copy of the engineer's report, a statement of the cash value and the assessment of the land and a field plan of the proposed work. An engineer of the Public Works Department is then to make a full report on all matters alleged in the application and upon his report the Lieutenant-Governor in Council may pay out of the Consolidated Revenue Fund such proportion of the cost of the undertaking as he may deem reasonable, after approval by resolution of the Legislature.

#### MANITOBA'S METHODS

The Land Drainage Act of Manitoba, as given in the Revised Statutes of 1913, comprises 64 sections. On the petition of

a majority of the property holders interested, the Lieutenant-Governor in Council may organize the lands or territory covered into a drainage district. Previous to this being done a competent engineer is to report upon the probable cost and as to whether the work would be a public benefit. Upon receipt of the report the Minister of Public Works, under whom the Act is administered, must submit the same to the Lieutenant-Governor in Council. The work being approved the cost is to be apportioned according to the engineer's estimated value of the benefit received. Debentures of the district bearing the seal of the province, are then to be issued for a period covering not less than twenty years, nor more than thirty-five, at a rate of interest not exceeding 6 per cent per annum. The Lieutenant-Governor in Council, if thought advisable, can guarantee such debentures or the funds of the province can be invested in them to the extent of not more than \$200,000. Exemption from collection for the first five years can be granted. The assessment on land benefited by the drain cannot be raised until the debentures have been fully paid. When the debenture debt of any drainage district has been reduced to \$8,000 or less the province may assume the balance of the liability. Lands outside a recognized district using the drainage work for an outlet are to be charged for the same according to the benefit derived. Obstructions must be removed on the order of the municipal council or the council may order the removal and assess the cost against the owner of the lands in obstruction with 10 per cent added thereto. The Minister may authorize the construction of bridges or culverts throughout the course of the work, or he can continue the drain beyond the lands interested to provide any outlet required. Extension work can be undertaken by a council to the extent in value of \$2,000, but beyond that amount any work necessary is to be undertaken by the Minister, the cost not to exceed \$5,000 and to be levied upon the lands. Municipalities are responsible for the maintenance of the drainage work. In the Minister is vested the power to award payment for any damages caused by the performance of the work. The special drainage tax must in no case be allowed to be in arrears for more than two years. The removal or defacement of signs put up by order of the engineer brings a penalty of not less than five dollars, nor more than a hundred dollars, or sentence to imprisonment for a term not exceeding six months. Wilful obstruction to the drain entails a fine of not less than five dollars nor more than fifty, and in default of payment to imprisonment for not less than one week, nor more than two months. Treasurers of municipalities disobeying the Act may be dismissed from office by the Lieutenant-

Governor in Council and be prosecuted, in which case they become liable a to fine of one hundred dollars or to imprisonment for terms not exceeding six months.

#### DRAINAGE ACT OF SASKATCHEWAN

In The Drainage Act passed by the Saskatchewan Legislature in 1909 and amended in 1913, the definition of drainage work is given as the construction of a drain, or drains, the deepening, straightening, widening, cleaning of obstructions, or otherwise improving any stream, creek or water-course and the lowering of waters of any lake or pond and the construction of guards necessary therewith." As in Manitoba, so in Saskatchewan, The Drainage Act is under the administration of the Minister of Public Works. While, however, the Manitoba Act requires a petition from a majority of the property owners before a drainage district is formed, the Saskatchewan Act requires a petition from the resident owners of at least one-half the area of the lands of resident owners interested before such a step is taken. The Minister is to appoint an engineer on the organization of a district whose duties will be the same as described in the Manitoba Act. Indeed, henceforth the working provisions of the Saskatchewan Act are to all intents and purposes the same as the Manitoba Act, the secretary or treasurer of the municipality in which the work lies for purposes of the Act being in each case an officer of the Minister. For defacement or removal of authorized signs penalties are the same, as is also the liability to prosecution of an offending treasurer of a municipality. For wilful injury or obstruction to the work the penalty under the Saskatchewan Act must not exceed \$200. By the amendment of 1913 right of appeal to the County Judge against any assessment is given and the right of withdrawal from a petition is further described. No provision is made for assumption by the province of the debenture debt when it has been reduced to a certain amount, as is the case in Manitoba.

#### ALBERTA'S DRAINAGE ACT

All the drainage acts of the Prairie Provinces and those of British Columbia are under the administration of the Minister of Public Works. As in Saskatchewan so in Alberta, in addition to The Drainage Act there is a measure cited as The Private Ditches Act. The Alberta Drainage Act was passed in 1908 and revised in 1916. The definition of drainage work is identical with that of the Saskatchewan Act. A petition from the owners of at least two-thirds of the land affected is required before a district is organized. The Minister can then appoint an engineer to report upon the necessity for the work and the cost thereof. After that the procedure lies upon the same lines as in the other Prairie

Provinces. Appeal against assessments to the County Court Judge is also provided for. In Manitoba and Saskatchewan the debentures issued to defray the cost of the work are to run for not less than 20 years, nor more than 35 years, but in Alberta they can be made to run for not less than ten years. The rate of interest in each case is not to exceed 6 per cent. In other respects also the operative provisions of the Act are practically the same as in the other Prairie Provinces, including the penalties for defacement of signs. For injury to the work the liability incurred under the Alberta Act is not less than \$5, not more than \$200, and in default of payment imprisonment for not less than one week nor more than two months. No provision is made for the assumption by the province of any part of the debenture debt.

#### PRIVATE DITCHES' ACTS

Both Saskatchewan and Alberta have on their statute books a measure cited as The Private Ditches Act. Except as regards the limit to the cost of the work and in a few minor particulars, the Acts are identically the same, even to the number of clauses (39) which they contain. The limit to the cost of the work that can be undertaken under the Act in Saskatchewan is \$2,000 and in Alberta \$5,000. A ditch is described as meaning and including "a drain open or covered wholly or in part, whether in the channel of a natural stream, creek or water-course or not, and also the work and material necessary for bridges, culverts, catch basins and guards." The owner of a parcel of land requiring a ditch to be made must notify in writing the owners of other lands affected, and summon them to a meeting at a place near the site of the proposed ditch on a certain day and date not less than twelve days after the notice has been issued. If an agreement is reached it must be reduced to writing and filed with the secretary of the municipality. If an agreement is not reached the party of the first part can file a requisition giving all the details required in a set form with the secretary of the municipality. Upon receipt of the requisition in either case an engineer is to be appointed to report upon the work proposed and the cost thereof. If the engineer reports that the ditch is required then the work can be undertaken, and the same procedure followed as to the apportionment of the expenditure and the collection thereof practically as set forth in the Drainage Act of the respective provinces. Appeal can be made against any ruling to the District Judge. If heavy work is required the engineer can let it out by contract. The treasurer of the municipality is authorized to pay for such work and to assess the cost to the owners profiting. If they do not pay forthwith 10 per cent. is to be added to the amount due, and collection made as in the case of municipal taxes.



# BRITISH COLUMBIA.

In 1913 British Columbia repealed the Dyking, Drainage and Irrigation Act, given in the revised Statutes of 1911, and passed another Act bearing the same title. In the following year "Irrigation" was struck out, and the measure left to stand as The Drainage and Dyking Act. The Act covers everything that is necessary for drainage or dyking. When the owners of any land desire to make use of the powers granted under the Act, they can petition the Lieutenant-Governor in Council for the appointment of three commissioners, naming them themselves, to execute and maintain the same. The petitioners are also required to describe the lands affected and to give a name to the proposed district. Notice of the petition must be given in a local paper and in the provincial *Gazette*. To secure action the petition must be signed by a majority in value of the owners. Upon the work being authorized by order-in-council the Commissioners become a body corporate and solely responsible for carrying on and maintaining the work. They can fix their own remuneration, but it must not exceed \$5 a day while actually engaged in the duties entailed, nor must it exceed \$100 a year each. They can appoint an engineer, but the appointment must be confirmed by the Lieutenant-Governor in Council. The work is to be carried on and paid for in the same manner as similar work in the Prairie Provinces. Appeals against assessment must be made to the Court of Revision. The same rights are vested in the Crown lands as in those of private owners. Appeal as to assessment can be taken from the Court of Revision to the County Court Judge. Assessments are the first charge upon the lands. If the majority pray for a new assessment such can be made on the report of the engineer. The Commissioners are given powers of expropriation, by arbitration if an agreement cannot otherwise be reached. If a bridge is necessary the Commissioners must pay for the same. Owners must supply men and implements for the work on requisition, or the Commissioners can supply the same themselves. Appeal can be taken from the engineer to the County Court Judge. The Commissioners are empowered to borrow and issue debentures upon the security of the lands or can borrow upon security of the taxes. Inspection engineers can be appointed by the Lieutenant-Governor in council. If any person disobeys an order of the Commissioners or wilfully damages any of the works a fine not exceeding fifty dollars must be paid for every offence. By an amendment passed in 1915 sales of lands can be ordered for default in payment of assessments or fines. The sheriff must give three months' notice of sale and is entitled to charge three per cent on the amount realized.

## DITCHES AND WATER-COURSES.

British Columbia has a Ditches and Water-courses Act, the main provisions of which, excepting altogether in the wording and in the arrangement of the sections, are identical with those of the Ontario Act excepting also that, whereas in Ontario the limitation of cost under the Act is \$1,500, in British Columbia it is \$2,500. The British Columbia Act further contains a section especially referring to railway companies. Arrangements can be entered into between the companies and the municipality whereby the companies can construct a ditch or culvert, for which the municipality is to pay and assess the cost among the land owners, exclusive of any part for which the municipality may be liable under the award. Except with the consent of two-thirds of the owners no special liability is to be imposed on them on this account. The cost of such work on railway lands is to be exclusive of the limit of \$2,500 allowed as the total cost of the work. The Ontario Act covers the case by providing that the period (thirty days) prescribed for the engineer to make his award shall be exclusive of the time required to obtain the approval of the works or the specifications or the plans thereof, where such approval is necessary, of the Ontario Railway and Municipal Board or the Board of Railway Commissioners for Canada. There is in addition a difference in the notice to be given by the engineer in the letting of incomplete work. The Ontario Act requires that four days' notice shall be given, but the British Columbia Act calls for six days.

NOTE.—Articles and symposia on farm drainage and land drainage will be found in THE AGRICULTURAL GAZETTE as follows:

Vol. I.—Experimental Work in Manitoba, page 115; Farm Drainage, Ontario, page 373; Farm Drainage, Quebec, page 377; Farm Drainage, Prince Edward Island, page 378; Tiled Drainage Act, Prince Edward Island, page 488; Drainage Campaign in Manitoba page 495; Drainage Demonstration, New Brunswick, page 659.

Vol. II.—Tile Draining at Agricultural College, Manitoba, page 450; Underdraining in Nova Scotia, page 1092.

Vol. III.—Farm Drainage, Prince Edward Island, page 325; Farm Drainage Nova Scotia, page 327; Farm Drainage, New Brunswick, page 327; Farm Drainage, Quebec, page 329; Farm Drainage, Macdonald College, page 329; Farm Drainage, Manitoba Agricultural College, page 330; Drainage Work for 1916, Ontario, page 441.

Vol. IV.—Land Drainage Prince Edward Island, page 186; Nova Scotia, page 187; New Brunswick, page 187; Quebec, page 189; Ontario, page 190; British Columbia, page 192; Acts Relating to Agriculture (Drainage in all its Phases), pages 989 and 1097.

## STUDENT ENROLMENT, 1917-18

THE following table shows the number of students enrolled at the Agricultural Schools and Colleges and the Veterinary Colleges in Canada for the college year 1917-18:

## NOVA SCOTIA

AGRICULTURAL COLLEGE, TRURO	
First year.....	29
Second year.....	26
Total.....	55

In comparison with former years' attendance the great majority of these boys are in their teens, that is, below military age. This is a little less than half the pre-war attendance.

## QUEBEC

## MACDONALD COLLEGE

## School of Agriculture.

	Men	Women	Totals
1st year.....	25	3	28
2nd year.....	14	—	14
3rd year.....	4	—	4
4th year.....	9	2	11
Totals....			57

## School of Household Science.

Institution Administration Senior	5
Institution Administration Junior	7
Homemakers.....	41
Autumn Short Course.....	11
Total.....	64

## OKA AGRICULTURAL INSTITUTE, LA TRAPPE

1st year.....	13
2nd year.....	31
3rd year.....	21
4th year.....	19
Special courses.....	31

Total..... 115

## SCHOOL OF AGRICULTURE, STE. ANNE DE LA POCATIÈRE

## Short Course:

First year.....	36
Second year.....	26
	62

## Agricultural Course:

First year.....	25
Second year.....	23
Third year.....	12
	60

Total, 122.

## ONTARIO

## AGRICULTURAL COLLEGE ATTENDANCE

Statement of attendance at the Ontario Agricultural College, Guelph, fall term commencing September 21st, 1917.

## Agricultural Classes—

First Year.....	76
Second year.....	32
Third year.....	39
Fourth year.....	36
Normal Course in Manual Training...	4

## Classes at Macdonald Institute—

Normal domestic science—junior...	13
“ “ “—senior...	12
Associate, —junior...	16
“ “—senior...	9
Third year.....	4
Housekeeper, —junior...	21
“ “—senior...	9
Homemaker, —“A”...	19
“ “—“B”...	6
Short course in domestic science...	15
Student workers.....	2

Total attendance ..... 313

## MANITOBA

## AGRICULTURAL COLLEGE

The following statement gives the number of students enrolled in each of the years in agriculture and home economics at the Manitoba Agricultural College. Twelve farm boys of the first year and nine of the second year have applied for admission.

## Agriculture:

1st year.....	56
2nd year.....	17
3rd year, diploma.....	4
3rd year, degree.....	16
4th year.....	11
5th year.....	9

113

## Home Economics:

1st year.....	47
2nd year.....	13
3rd year.....	13
4th year.....	5
5th year.....	6

84

Total, 197.

## SASKATCHEWAN

## AGRICULTURAL COLLEGE

## Associate Course:

First year.....	66
Second year.....	13
Third year.....	9

88

*B. S. A. Course:*

		Boys	Girls
Freshman.....	9	56	29
Sophomore.....	6	18	18
Junior.....	2		
Senior.....	5		
	22	74	47

Total, 110.

## ALBERTA

## COLLEGE OF AGRICULTURE

*Agriculture:*

First year.....	15
Second year.....	4
Third year.....	17
Fourth year.....	5
Fifth year.....	9
	50

*Household Science:*

First year.....	1
Total, 51.	

## SCHOOL OF AGRICULTURE, VERMILION

Men: 1st year 32; 2nd year, 10.

Women: 1st year 4; 2nd year, 5.

At the date of making this return (Nov. 3) it was expected the first year's men's class would be increased to 40, and the second year's class to 14 men, the first year women's class to 8, and the second year women's class to 9.

## SCHOOL OF AGRICULTURE, CLARESHOLM

First year girls.....	20
First year boys.....	60
Second year girls.....	7
Second year boys.....	15

Total..... 102

## SCHOOL OF AGRICULTURE, OLDS

Following is the enrolment of students for the various classes for the present college year:

In addition to these we have eighteen wounded returned soldiers who are taking re-training in agriculture.

The ages of boys who are registered with us this year run from sixteen to nineteen. Before the war the average age of students was between twenty-one and twenty-two years.

## BRITISH COLUMBIA

## COLLEGE OF AGRICULTURE

On September 25th the first class in agriculture in the University of British Columbia was enrolled. Seven students were registered for this course. The only work leading to the Degree of B.S.A. is that being given to the Freshman class.

The University has not yet organized a department of Household Science.

## MONTREAL

## SCHOOL OF COMPARATIVE MEDICINE AND VETERINARY SCIENCE

First year.....	14
Second year.....	18
Third year.....	11
Total.....	43

## TORONTO

## ONTARIO VETERINARY COLLEGE

Following is the enrolment of students for the various classes for the present year:

First year.....	18
Second year.....	32
Third year.....	49

Total..... 99

The falling off of students in the first year class is no doubt due to some extent to the fact that a four-year course is starting this year, and also to the great need of young men for the army.

## ASSOCIATION OF AMERICAN AGRICULTURAL COLLEGES AND EXPERIMENTAL STATIONS

THE Thirty-first Annual Convention of the Association of American Agricultural Colleges and Experiment Stations was held at Washington, D.C., November 14th to 16th. The attendance included the leading men and women directing agricultural and home economic education in all the forty-eight States of the Union. Between three and four hundred were registered.

In addition to questions of policy and plans for the improvement of the regular

work being carried on in the various institutions, the programme this year dealt largely with subjects concerning the colleges in their efforts to contribute as fully as possible towards winning the war. The following topics as examples, will be of interest to leaders in agricultural work in Canada at the present time:—"The best things done by the Colleges to aid the Government in the war emergency"; "How the Land Grant College organizations may be planned to serve the Govern-



ment in the war emergency"; "Federal programme for extension work during the war", and "The necessity and purpose of food conservation".

Notable features of the programme also were addresses by Hon. D. F. Houston, Secretary of Agriculture, and Herbert Hoover, Food Controller. Mr. Houston outlined very clearly the understanding which has been arrived at between his Department and the Food Controller, in regard to stimulating food production within the nation. At the beginning of the campaign misunderstandings occurred, but it has now been arranged that the De-

partment of Agriculture, assisted by the State Agricultural Colleges and their affiliated organizations, shall have entire charge of all efforts towards increasing food production.

Mr. Hoover placed clearly before the meeting the serious aspects of the present food shortage, and showed the probability of an even more serious condition existing later. He made a stirring appeal to the agricultural leaders to put forth the most strenuous efforts to awaken producers to a realization of humanity's need. "Food," he said, "would win the war; food might lose the war."

## ASSOCIATIONS AND SOCIETIES

### NEW BRUNSWICK WOMEN'S INSTITUTES

The fifth annual convention of the New Brunswick Women's Institutes was held at Moncton, October 2nd, 3rd and 4th. The report of the Supervisor, Miss Hazel E. Winter, indicated an increase of ten branches since November, 1916, making a total of 92, with a membership of 2,600. The financial statements of seventy-five institutes showed that from July, 1916, to June, 1917, there had been \$14,505.61 raised and that the expenditure had been \$11,361.48. An additional \$2,641.03 was recently raised by 71 institutes and sent to Halifax as a gift from the New Brunswick Women's Institutes to the Y.M.C.A. war fund. During the summer of 1917, 102 meetings were held, at which the attendance was 4,913. At last winter's apple show in St. John, 22 institutes exhibited 535 jars of fruits and vegetables and the Department awarded \$50 in prizes. At this year's convention 43 institutes exhibited 469 jars of canned fruits, vegetables and meats and the Department gave \$101 in prizes. For the best average attendance of members at meetings and the most carefully planned and carried out programmes from January, 1918, to June 30, 1918, six prizes amounting to \$90 would be distributed. Prizes would also be given for the best written essays on "Thrift and Economy", "Systematic House-keeping", and "Advantages to a Community of Having a Women's Institute". The Department would give three prizes for each subject, amounting to \$66. The

essays are not to exceed 1200 words and should be in by December 31st of the present year.

A number of papers were read at the different sessions on appropriate subjects and at the close a series of resolutions were carried. These urged the Food Controller to so regulate the price and distribution of feed to the farmer as to enable him to produce the supply of milk necessary and to regulate the price of milk to the consumer; asked that a woman be placed on the Provincial Board of Censors for Moving Pictures; urged mothers to endeavour to secure medical inspection of schools; suggested the advisability of making it possible for women, other than ratepayers, to become members of rural school boards; urged that other grains, besides wheat, used for food and feed purposes, should not be used in the making of spirituous liquors; pledged the hearty support of the women to the Food Controller; asked the co-operation of the Provincial Department of Agriculture with the University at Fredericton in securing a system of lending libraries; suggested that women should be appointed on hospital and municipal home boards and urged that women should be appointed to the various governing bodies of the board of health, as it is upon them that the evils resulting from public uncleanliness principally fall. Miss Winter, the supervisor, was presented with a club bag.

### ONTARIO HORTICULTURAL ASSOCIATION

At the annual meeting of the Ontario Horticultural Association, held in Toronto on November 23rd, the following officers were elected: President, T. D. Dockray, Toronto; First Vice-President, Prof. J. W.

Crow, O.A.C., Guelph; Second Vice-President, Wm. Hartry, Seaforth; Secretary and Editor, J. Lockie Wilson, Toronto; Treasurer, C. A. Hesson, Toronto; Hon. Director, Dr. F. E. Bennett, St. Thomas.

## QUEBEC STOCK BREEDERS' ASSOCIATION

BY DR. J. A. COUTURE, SECRETARY

The eighth annual sale of pure-bred stock of the General Breeders' Association of the province of Quebec took place on the 10th of October at Montreal, and on the 17th of October at Quebec. There were put up for sale 295 animals, namely:—97 cattle, 122 sheep and 76 swine. The cattle, which were mostly all calves ranging from 6 to 10 months of age, comprised

70 Ayrshires, 20 French Canadians, 7 Holsteins. The sheep comprised 19 Cotswolds, 47 Leicesters, 12 Lincolns, 22 Hampshires, 9 Oxfords, 9 Shropshires and 4 Cheviots. The swine comprised 39 Yorkshires, 28 Chesters, 8 Tamworths and 1 Berkshire. A detailed statement of the sale at both places is given below:—

BREED AND KIND	AT MONTREAL			AT QUEBEC		
	Number of Animals Sold	Highest Price Obtained	Average	Number of Animals Sold	Highest Price Obtained	Average
<b>CATTLE:</b>						
Ayrshires.....	26	\$150	\$80	44	\$146	\$78
French-Canadians.....	7	80	67	13	135	83
Holsteins.....	3	75	88	4	117	86
<b>SHEEP:</b>						
Leicesters.....	16	65	46	31	55	42
Cotswolds.....	12	49	31	7	35	32
Lincoln.....	7	39	35	5	65	38
Shropshires.....	3	65	40	6	40	32
Hampshires.....	12	70	42	9	51	38
Oxfords.....	6	80	48	3	67	54
Cheviots.....	2	46	40	2	54	40
<b>SWINE:</b>						
Yorkshires.....	16	100	68	23	97	57
Chesters.....	10	71	60	18	71	42
Berkshires.....	1	50	..	..	..	..
Tamworths.....	4	53	48	4	60	42
Average for all of the cattle \$78 at Montreal; \$82 at Quebec.						
“ “ sheep	41	41	“			
“ “ swine	56	47	“			

The animals were scattered throughout the province, having been bought by 87 agricultural clubs, 3 agricultural societies and 44 private individuals. The expenses incurred in connection with the sale amounted to 35 per cent of the purchase price of

the animals. The association is also making a sale of pure-bred sheep at fourteen points on the Intercolonial Railway from Levis to Rimouski, between November 13th and December 5th.

## UNITED FARMERS OF ONTARIO

A convention of the United Farmers of Ontario and the United Farmers' Co-operative Association Company, Limited,

will be held at Toronto on December 19th, 20th and 21st. J. J. Morrison, Secretary, United Farmers of Ontario.

## WESTERN CANADA LIVE STOCK UNION

The Fifth Annual Convention of the Western Canada Live Stock Union was held at Regina, Sask., on November 14th and 15th. Dr. J. G. Rutherford, president of the Union, occupied the chair. Addresses were delivered at the opening by the Lieutenant-Governor, the Premier of the Province and the Deputy Minister of Agriculture for Saskatchewan. Mr. J. D. McGregor, representing the National Food Control Commission, impressed very strongly on the convention the necessity of increased live stock production and especially of swine. Mr. D. Johnston, of the Dominion Live Stock Branch, dealt with

the transportation facilities afforded Western Canada. Mr. G. H. Hutton, of the Dominion Experimental Station at Lacombe, Alta., went very thoroughly into the general live stock situation, quoting statistics to illustrate the extreme seriousness of existing things.

Resolutions passed at the meeting of Western representatives in Ottawa in connection with the pork production campaign were taken into consideration, and, after thorough discussion, resolutions were passed urging that every care should be taken to exempt experienced labour on farms as far as possible; that alien labour

should be conscripted to work on farms; expressing appreciation of the Live Stock and Live Stock Products Act and respectfully urging that it be put into force at the earliest possible moment; urging the provincial Governments to remove to as great an extent as may be found possible, the burdens imposed upon the live stock industry by the existing herd laws, thus rendering available areas of grazing lands at present going to waste; asking the removal of the war import tax on corn and similar feed

stuffs entering Canada; urging that, as a war-time measure, cities and other urban municipalities relax their regulations *re* the keeping of pigs within their boundaries, thus enabling householders to utilize garbage to the fullest extent, and requesting the committee of the Union on transportation to investigate existing transportation problems and to take such action as may be deemed necessary on behalf of the live stock interests of the West.

### A "GUIDE" SEED FAIR

The Grain Growers' Guide held its first seed fair at Winnipeg on November 1st and 2nd. In preparation for this fair *The Grain Growers' Guide* last spring distributed to farmers at over 420 different points throughout Western Canada selections of the best registered seed obtainable. All this seed was grown in the Prairie Provinces under the rules and regulations of the Canadian Seed Growers' Association and registered by that body. At the same time as the seed was distributed the United Grain Growers Limited announced the offering of \$500 in gold as prizes for the seed fair. *The Guide* also provided to each person who received seed, instructions for its treatment and cultivation. Each grower was required to supply for the seed fair one-half bushel and a small sheaf of the grain. The judges selected for the seed fair were Seager Wheeler, thrice winner of the world's championship for registered wheat; George Seals, chief grain inspector for Western Canada, and Professor T. Harrison of the Field Husbandry Department of the Manitoba Agricultural College. So large was the exhibition and so keen the competition that it occupied two and a half days of the time of these judges in placing the awards.

In awarding the prizes the judges allotted 300 points for the grain and 100 points for

the sheaf. The points for the grain were 150 for freedom from weed seeds, other kinds of grain, useless impurities and smut and purity of variety, 150 points for soundness of grain, freedom from rust, frost, etc., damage, uniformity of size, trueness of type, milling value and uniform colour. The points for the sheaf were 25 for general appearance, 10 for freedom from weeds and other grains and 65 for quality of the heads and the grain in the head. In wheat 42 entries were secured, these scored in the sack from 293 $\frac{1}{4}$  to 234 points. For sheaves the score ran from 91 $\frac{1}{4}$  to 70. Twenty money awards were allotted, the first being \$100 in addition to a gold medal donated by Dr. Jas. W. Robertson, down to \$3.00 for the twentieth prize.

Four prizes were awarded for barley and four for oats, ranging from \$25 to \$7 for barley and \$40 to \$8 for oats. Barley scored for grain 282 to 249 and for sheaf 90 $\frac{1}{4}$  to 78 $\frac{1}{2}$ . For oats the scores were for grain 274 $\frac{1}{2}$  to 239 $\frac{1}{4}$  and for sheaf 96 to 87 $\frac{1}{2}$ . Each exhibitor will be given his score card so that he may learn wherein his exhibits were deficient.

It is announced that *The Grain Growers' Guide* has already selected seed for distribution this coming spring for the second seed fair to be held next fall.

### AGRICULTURAL RELIEF OF THE ALLIES COMMITTEE

The committee in Manitoba for the Agricultural Relief of the Allies Fund is as follows:—President, R. C. Henders, President of the Grain Growers' Association; Vice president, J. B. Reynolds, Pres. Agricultural College; Secretary treasurer, J.

H. Evans, Acting Deputy Minister of Agriculture; Directors, R. McKenzie, Secretary Canadian Council of Agriculture, and S. A. Bedford, Chairman Weeds Commission.

### THE SASKATCHEWAN LIVE STOCK ASSOCIATIONS

At a joint executive meeting held in Regina on November 16th, it was decided to have the annual meetings of the associations take place in Regina on January 3rd and 4th next. While those present agreed that the College of Agriculture at Saskatoon

offered superior facilities for the holding of the meetings, it was generally admitted that, due to conditions arising from the war, such as labour shortage, which would make it difficult for farmers to be away from home for any length of time, only business



meetings should be held and, for this year, at least, demonstrations and lectures should be dispensed with. These meetings will include the Saskatchewan Cattle,

Horse, Sheep, Swine and Poultry Breeders' Associations. The Secretary is P. F. Brett, B.S.A., Department of Agriculture, Regina.

### SASKATCHEWAN DAIRYMEN'S CONVENTION

The annual convention of the Saskatchewan Dairymen's Association will be held at the University of Saskatchewan, on January 9th and 10th. In addition to the regular features this year there will be a Creamery Butter Makers' Competition. Each month since May a fourteen pound box has been sent into storage from the creameries which are competing so that when the butter comes to be judged, six boxes from each creamery will be examined. The three scoring first place, in addition to being awarded prizes of \$30, \$25, and \$20, respectively, will go into com-

petition with the three best from Alberta and Manitoba at the interprovincial contests to be held in Winnipeg at the time of the meeting of the Manitoba Dairymen's Association. Prizes for this contest are \$60, \$40, and \$25, for the first, second and third, respectively.

In addition to the Butter Makers' competition, it is hoped to have a butter judging competition, open to creamery managers and their assistants, also a boys' stock judging competition. The secretary of the association is K. G. MacKay, M.Sc., Professor of Dairy Husbandry.

### ALBERTA CATTLE BREEDERS' SALE

A dairy cattle and swine sale was held at Calgary by the Alberta Cattle Breeders' Association on October 30th. Thirteen Holsteins sold for \$1280.00, the average being \$98.50, and one dairy Shorthorn fetched \$125.00.

In the swine sales, eighteen Duroc Jerseys sold for \$468.00, an average of \$26.00.

Thirty-two Berkshires sold for \$1460.00, an average of \$45.60, and one Poland China brought \$30.00. At the same sale the Canada Land and Irrigation Company disposed of twelve Berkshire boars at an average price of \$42.58. The highest price in the swine sale was paid for a Berkshire boar, namely, \$111.00.

### ALBERTA SHEEP BREEDERS' SALE

A record sale of sheep was held by the Alberta Sheep Breeders' Association at Calgary on October 31st. Two hundred and twenty-nine ewes were sold for \$5,258.75, an average of \$22.95, and one hundred and twenty-three rams for \$5,008.00, an average of \$40.70, the grand total being three hundred and fifty-two sheep for \$10,266.75, an average of \$29.16. The different breeds sold as follows:

Ewes	No.	Value	Average
Shropshire.....	64	\$1720.00	26.87
Oxford.....	36	1125.00	31.25
Grade.....	27	482.50	17.87

Grade Oxford.....	100	1841.25	18.41
Suffolk.....	2	90.00	45.00
Totals.....	229	5258.75	22.95
Rams.			
Shropshire.....	75	2215.00	29.50
Suffolk.....	14	1008.00	72.00
Oxford.....	33	1765.00	53.50
Southdown.....	1	20.00	20.00
Totals.....	123	5008.00	40.71

The highest price paid for a Suffolk ram lamb was \$112.00; the highest price for a shearling Oxford ram was \$250.00.

### ALBERTA SHEEP AND SWINE BREEDERS' SALE

The second annual sheep and swine sale of the Alberta Provincial Sheep and Swine Breeders' Association took place in the stock pavilion on the exhibition grounds at Edmonton on Friday, November 2nd. The number of entries was limited in order that there should be no surplus, if possible, over the demand. The result was most satisfactory.

Fifty-nine pure bred sheep were sold at an average price of \$51.29; thirteen Shropshire rams for \$698.00, an average of \$53.70; six Shropshire ewes for \$154.00, an average of \$25.67; sixteen Oxford rams

for \$1035.00, an average of \$64.70; twenty-one ewes for \$1113.00, an average of \$53.00; three Hampshire ewes for \$95.00, an average of \$31.67. Twenty-five grade ewes sold for \$446.00, an average of \$17.84. In all eighty-four sheep were sold and the total amount realized was \$3,541.00.

Twenty-one swine were sold for a total of \$934.00. One Yorkshire sow fetched \$50.00; three Duroc-Jersey boars sold for \$100; three sows for \$118; eight Berkshire boars for \$379, an average of \$47.38; and six Berkshire sows for \$287, an average of \$47.83.

## BRITISH COLUMBIA WOMEN'S INSTITUTE CONFERENCES

Conferences of Women's Institutes of British Columbia were held at Vernon, Cranbrook, Duncan and Mission City in September and October, each of two or three days' duration. The programmes consisted largely of reports of institutes and discussions on national, local and household subjects. The attendance at

the different sessions varied from 40 to 150. Following are the officers of the advisory board of women's institutes for the province: Mrs. Jas. Johnstone, Nelson, Convener; Mrs. M. S. Davies, Chilliwack, Secretary; Mrs. Blackwood-Wileman, Duncan, and Mrs. R. L. Lipsett, Summerland, members.

## CANADIAN BROWN SWISS ASSOCIATION

Mr. Ralph H. Libby, Stanstead, Que., Secretary of the Canadian Brown Swiss Association announces that the annual

meeting will be held on January 2nd at Sherbrooke.

## THE POTATO ASSOCIATION OF AMERICA

The fourth annual meeting of the Potato Association of America was held at Washington, D.C., on November 9th and 10th. A special effort had been made to make this meeting of an international character and letters had been sent to Canada urging that delegates should be sent. Some of the delegates present were Mr. W. T. Macoun, representing the Dominion Government; Dr. C. A. Zavitz, Messrs. P. W. Hodgetts and R. S. Duncan, Ontario; two delegates from Manitoba, including Mr. J. H. Evans, Deputy Minister of Agriculture; two from New Brunswick, including Hon. J. F. Tweeddale, Minister of Agriculture; Mr. W. S. Blair from Nova Scotia, and Mr. A. E. Dewar and another delegate from Prince Edward Island.

Special attention was given on the programme to the feeding value of potatoes

both for man and animals, drying of potatoes and other methods by which the potato could be utilized. The distribution of the potato crop and the car movement of potatoes was also discussed, as well as many questions in regard to their cultivation. While no actual plan of co-operation between Canada and the United States in regard to the handling of the potato crop resulted from this meeting, the information given by the Canadians present and that which they received is expected to result in a better understanding of the situation in both countries. The meeting was addressed by Mr. Hoover, Food Controller, who spoke of the food supply of the allies and how it must be maintained. Mr. Lou D. Sweet was re-elected President of the Association and Mr. W. T. Macoun, Dominion Horticulturist, was elected first vice-president.

## NEW PUBLICATIONS

## THE DOMINION DEPARTMENT OF AGRICULTURE

## THE DOMINION EXPERIMENTAL FARMS

*Reports in separate form.* For the convenience of farmers and others interested in the subjects dealt with in the three-volume report of the Dominion Experimental Farms for the year ending March 31st, 1916, the reports of several divisions have been issued separately in pamphlet form. These reports which give full details of tests and experiments made, are those of the Dominion Husbandman, E. S. Archibald, B.A., B.S.A.; of the Dominion Cerealists, Chas. E. Saunders, B.A., Ph.D.; of the Dominion Horticulturist, W. T. Macoun; of the Supervisor of Illus-

trated Stations, John Fixter; of the Dominion Apiarist, F. W. L. Sladen, and of the Tobacco Husbandman, F. Charlan. These pamphlets include reports from the various experimental farms and stations in different parts of Canada.

*Farm Egg and Poultry Accounts.*—For the convenience of poultry raisers the Dominion Poultry Husbandman has worked out a sheet on which may be entered records of eggs laid and receipts and expenditures so classified as to show to what extent the flock is profitable. The sheets are for free distribution.

## THE DIVISION OF ANIMAL HUSBANDRY

*Finishing Lambs for the Block*, by E. S. Archibald, B.A., B.S.A., Dominion Husbandman, Pamphlet No. 16, consists of

four pages, describing the profits to be derived from breeding and raising sheep. A table is given detailing the average profit over the cost of feeding lambs on the different experimental farms in Canada during the previous seven years. A section of the pamphlet is devoted to telling of feeds for winter lamb finishing and the cost of equipment.

### THE ENTOMOLOGICAL BRANCH

*"Regulations under the Destructive Insect and Pest Act*, with instructions to importers and exporters of trees, plants and other nursery stock", is the title and description of Circular No. 10 of the Entomological Branch, of which Dr. C. Gordon Hewitt, Dominion Entomologist, is the author. It is a 12-page circular designed as a guide to importers and exporters of plants and other nursery stock, and, besides a full exposition of The Destructive Insect and Pest Act, contains a statement of the conditions under which shipments can be made to the United States.

The report of C. Gordon Hewitt, D.Sc., F.R.C.S., Dominion Entomologist, just published, covers the year ending March 31st, 1917. It makes a pamphlet of twenty-four pages and especially deals with administration of the Insect and Pest Act; the introduction of parasitic insects and the study of natural control; insects affecting grain and field crops, garden and green house, forests and shade trees, domestic and other animals, and household and public health. It also records in brief the work at the Entomological Field Laboratories throughout Canada and notes that a special circular on the control of flies and lice has been prepared for the Canadian Expeditionary Forces and distributed.

### THE PROVINCIAL DEPARTMENTS OF AGRICULTURE

#### QUEBEC

The report of the Quebec Society for the Protection of Plants from Insects and Fungous Diseases for 1916-17 makes a book of 150 pages. It contains a number of illustrations and a series of descriptive and instructive papers by Dominion and Provincial experts.

#### ONTARIO

The forty-eighth annual report of the Fruit Growers' Association of Ontario for 1916 makes a blue book of ninety-two pages. It contains a full report of the annual meeting held in Toronto on February 8th and 9th. The papers given include "Varieties of Apple for Planting", "The Necessity of New Apple Orchards in Western Ontario", "Care of the Orchard

during the labour scarcity", "Fall Ploughing", "Does the Inspection and Sales Act Protect the Consumer", "Dusting as a Substitute for Spraying", "Dusting for Tender Fruits and Apples", "The Railway Situation", "Growing Strawberries in the Clarkson District", "Light Crops and their Causes", "Sweet Cherries", "The White Pine Blister Rust in Canada", and "The Marketing Situation in the Niagara District".

The thirty-eighth annual report of the Ontario Agricultural and Experimental Union for 1916 makes a blue book of ninety-two pages. It gives the results of co-operative experiments in agriculture by Dr. C. A. Zavitz, of co-operative experiments in apiculture by Morley Pettit, in weed eradication by J. E. Howitt, papers on what Ontario should do in regard to potato production, production of grain food stuffs, the home vegetable garden, production of animal food stuffs, dairy products in Ontario, the farmer's apple orchard, the management of soil fertility, cultivation of the soil, fertilizers and their use, all by college professors and other experts.

*The Wintering of Bees in Ontario*.—By Morley Pettit, Provincial Apiarist. This is an appropriately illustrated bulletin of twenty-four pages. It deals especially with the principles of successful wintering, methods of outdoor wintering, feeding for winter, cellar wintering and the spring feeding of bees.

*Tuberculosis of Poultry*, by Dan H. Jones, B.S.A., Professor of Bacteriology. We have here an eight-page illustrated bulletin written in response to many enquiries received at the Ontario Agricultural College regarding tubercular fowl. The cause, nature and control of the disease are dealt with.

*Dairymen's Associations*.—Verbatim reports of the proceedings at the annual meetings of the Eastern and Western Ontario Dairymen's Associations, with brief reports of the dairy school at the Ontario Agricultural College and the Eastern Dairy School at Kingston are given in this blue book of 142 pages.

*Insects Attacking Fruit Trees*, by Lawson Caesar, B.A., B.S.A., Provincial Entomologist, Bulletin 250. Professor Caesar in his introduction to this blue book of 55 pages says that he has not attempted to discuss all the insects that attack fruit trees in the province. This is true, but with a series of descriptive illustrations, he goes fully into the life-history, habits, methods and control of between fifty and sixty.



## MANITOBA

*The Gas Engine; Extension Bulletin No. 18*, by A. C. Campbell, Gas Engine Specialist, Agricultural College. This forty-page bulletin goes very fully into its subject, describing the principles of the gas engine, its constructive parts, its uses and, in short, virtually all that it is necessary to know in its management, utility and care. Numerous drawings and half-tone illustrations add to the instructional value of the bulletin.

## SASKATCHEWAN

*Weed and Seed Commissioner's Report.* The fifth annual report of the Weeds and Seed Branch of Saskatchewan makes a bulletin of 20 pages, covering the year ending April 30, 1917, and in it are recorded the activities of the half dozen field representatives of the province, the successes of Saskatchewan products at the International Soil Products Exposition, the results of the campaign against gophers and the doings of farm boys in camp and boys and girls in competition at fall fairs.

## MISCELLANEOUS

*Ayrshire Breeder's Annual Report.* The annual report of the Canadian Ayrshire Breeders' Association for 1916-17 contains, besides a full account of the proceedings at the annual gathering in Montreal in February of this year, the records of performance between May 1st, 1916, and May 1st, 1917, the constitution and by-laws, rules of entry and a deal of other information of value to Ayrshire breeders besides upwards of 40 full-page photographs. The official records of the breed revised up to May 1st, 1917, are published in the usual convenient pocket form with many illustrations of prize-winning and record-holding cows and details of the progeny of Ayrshire bulls that have registered in the Canadian Record of Performance test.

*Vancouver, B.C., Exhibition.* Bulletin No. 8. This pamphlet of sixty pages constitutes a directory of the officers and members of the Vancouver Exhibition Association and report of the annual meeting held at the end of October. It covers in detail the reports of the various departments of the exhibition held in 1917.

## NOTES

Investigations made by experts from the United States Department of Agriculture have proven that chilled dry-packed poultry keep much better and stand shipment better than wet ice-packed poultry.

The Lambton County, Ontario, Co-operative Association has had six months of satisfactory business, and has promise of larger developments. They expect to enter hog selling on a grade basis in the near future.

A group of farmers in Oxford County, Ontario, providing milk for a powdered milk factory have formed themselves into the Burford District Milk Producers' Association, for the purpose of securing their full rights in dealing with the factory which has more than 300 patrons.

The Food Controller announced on Nov. 20th that the export to the United States of hay as well as of live stock may be licensed until further notice by endorsement by the Customs Collector at the point of exit and the usual Shippers' Export entry. Live poultry is included under the ruling regarding live stock.

The County Council of Peel has decided to give prizes of \$15 and \$10 at the provincial Winter Fair at Guelph November 20th to December 6th, for the best pen of three fat lambs (one ram and two ewes) pure bred, of any breed exhibited, owned and bred by farmer's sons of the county.

Last spring an arrangement was made with the banks of the province of Ontario whereby farmers could borrow up to \$200 each on approved security for the purchase of seed for production during 1917. This offer was open up to July 1st. The loans actually made under this arrangement aggregated only about \$114,000.

Mr. R. M. Tipper, District Representative for Ontario Co., related an instance at a school fair which is significant. While explaining to a small group of boys what to look for when judging corn in the ear, they were very soon surrounded by a number of men who had gathered to listen to what was being said. When Mr. Tipper had finished his explanation one of the men turned to him and said, "I plainly see there is something in this for us older men to learn as well as the boys."

Mr. J. H. Hare, formerly connected with the Poultry Division of the Live Stock Branch at Ottawa, has been appointed poultry commissioner for Alberta with offices at Calgary. The object of this appointment is to encourage the production of the higher grades of eggs and poultry, the conservation of food by the elimination of unnecessary loss in marketing, the stimulation of production by the payment for produce on a quality basis.

Mr. George E. Day, Professor of Animal Husbandry at the Ontario Agricultural College, has been appointed Secretary-Treasurer of the Dominion Shorthorn Breeders' Association. He will assume his new duties on January 1st, and devote his whole time to promoting the interest of Shorthorns in Canada. Professor Day has been at the head of the Animal Husbandry Department of the Ontario Agricultural College since 1893.

The District Representative of Lennox and Addington, Mr. G. B. Curran, has issued two four-page leaflets, one urging farmers to breed all the hogs they can and showing the profit to be derived and the good work that will be accomplished by doing so and the other on "Crate Fattening of Chickens". The latter is illustrated and supplies full and practical information. The leaflets are large size, eight by ten and a half inches.

As a means of securing a mailing list for literature to be sent out to prospective short course students, Mr. E. P. Bradt, District Representative, Dundas County, sent a circular letter to each school teacher in the district adjoining the centre of the short course. The letter asked for a list of the young men in the respective sections between the ages of fifteen and thirty years. A stamped, self-addressed envelope was enclosed with each letter.

The British Columbia Department of Agriculture will hold a provincial seed fair at Armstrong on December 6 and 7. Forty classes are provided, including grains, potatoes, corn, grasses and clovers, roots, and the seeds of other garden crops. At the conclusion of the fair the Department will issue a Seed Growers' Directory which will include the names of those seed growers who have supplied exhibits to the provincial and other seed fairs held in the province.

The Hon. T. C. Norris, Premier of Manitoba, issued to Manitoba farmers a strong appeal to raise as many hogs as possible during the next twelve months. The Premier fortifies his appeal with a statement of facts relative to the urgent demands of the armies and the certain high prices for pork produce. The announcement is made that the Manitoba Government is setting a good example by largely increasing the number of brood sows kept on the Provincial Government farms.

The Board of Trade of Hamilton has launched a movement to establish an International Live Stock Show in that city on similar lines to that held in Chicago annually. The Board recently gave a banquet, to which about a hundred of the most representative breeders of Ontario and representatives of the dairy interests were invited. Among those who attended and addressed the gathering were: Mr. J. A. Ruddick, Dominion Dairy Commissioner; Professor H. H. Dean of the Ontario Agricultural College; Mr. C. F. Bailey, Assistant Deputy Minister of Agriculture for Ontario; and Messrs. J. E. Brethour, John Gardhouse, D. C. Flatt, D. O. Bull and H. M. Robinson. Finally a committee was appointed to bring the matter before the live stock breeding associations at their annual meeting in February.

To secure recruits in the "Fork for Freedom" campaign, Mr. W. D. Jackson, District Representative for Carleton county, Ontario, induced the authorities and business people of the village of Carp to close their places of business on one day, in order to supply men for the harvest field. The only places kept open were the bank and the railway station and these with reduced staffs. On the evening previous to the day of closing business, a number of men met in the District Representative's office and after getting in touch with the farmers and finding out what help they most needed, the men, thirty-six in all, were allotted, and the following morning were distributed by the citizens who owned motor cars. The men included merchants, doctors, clerks, barbers, clergymen and retired farmers. Their services were given voluntarily.

## INDEX TO PERIODICAL LITERATURE

*Agricultural Journal*, Victoria, B.C. October, 1917.

Every Farmer His Own Entomologist—Reasons Why and Methods How a Farmer Should Study his own Insect Troubles, R. C. Treherne, Field Officer, Entomological Branch, Dominion Department of Agriculture, page 149.

Grow Your Own Seed, by H. O. English, Chief Soil and Crop Instructor, page 151.

Provide Your Own Floral Luxuries, Professor L. Stevenson, Superintendent, Dominion Experimental Station, Saanichton, B.C., page 153.

*The Canadian Countryman*, Toronto, Ont., November 24th, 1917.

Fall Spraying of Fruit Trees—Saving Labour in the Farmer's Apple Orchard, L. Cesar, page 1437.

*The Canadian Horticulturist and Bee-keeper*, Toronto, November, 1917.

Plant Breeding at the Horticultural Experiment Station, Vineland, E. F. Palmer, Director, page 286.

Wintering Bees in Canada, C. Gordon Hewitt, B.Sc., Dominion Entomologist, page 291.

Wintering Bees in Manitoba, R. W. Muckle, Provincial Apiarist, page 294.  
Wintering Bees Outside, F. W. L. Sladen, Dominion Apiarist, page 296.

*Canadian Poultry Review*, Hamilton, Ont., November, 1917.

Poultry Breeding and Its Problems. Conducted by M. A. Jull, B.S.A., Poultry Manager and Lecturer, Macdonald College, Que., page 438.

*Canadian Poultry Journal*, Hamilton, November, 1917.

Dominion Experiment Station Poultry Houses—Two Up-to-date Plans of Poultry Houses. Suitable for City or Country with Specifications and Instructions for Material and Building, by Mr. F. C. Elford, Dominion Poultry Husbandman, page 328.

*Farmer's Advocate and Home Journal*, Winnipeg, November 7th, 1917.

Saving the Farm Machinery, by Professor J. MacGregor Smith, page 1535.

*Farmer's Advocate and Home Magazine*, London, Ont., November 22nd, 1917.

The Cost of Poultry Raising for 1916-1917, M. A. Jull, B.S.A., Poultry Manager, Macdonald College, page 1814.

*Farm and Dairy and Rural Home*, Toronto, November 22nd, 1917.

Will We Finish Lambs for the Block? E. S. Archibald, Dominion Animal Husbandman, page 1251.

November in the Poultry Yard, J. E. Bergey, Lecturer in Poultry Husbandry, Manitoba Agricultural College, page 1257.

*Farm and Ranch Review*, Calgary, Alta., November 5th, 1917.

The Care of Ewes in Winter, Professor Thomas Shaw, page 972.

*Grain Growers' Guide*, Winnipeg, October 17th, 1917.

Money When You Need It, E. A. Weir, B.S.A., page 1659.

Oct. 24—Everyone a Food Controller, Dr. Jas. W. Robertson, Chairman, Central Advisory Council to the Food Controller, page 1699.

*The Nor-West Farmer*, Winnipeg, October 20th, 1917.

Development of a Range Breed of Sheep—Mr. R. C. Harvey of Lethbridge District, has for some time been Crossing the Romney on the Rambouillet with the Idea of Producing a Better Range Sheep, Mr. J. McCaig of the Department of Agriculture, Edmonton, Discusses the New Breed, page 1101.

*The Saturday Press and Prairie Farm*, Saskatoon, November 10th, 1917.

Live Stock-Breeding and Feeding Swine, G. E. Day, B.S.A., Professor of Animal Husbandry, Ont. Agr. College, Guelph, Ontario, page 15.



# PART V

## The International Institute of Agriculture

T. K. Doherty, LL.B., Commissioner

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### FOREIGN AGRICULTURAL INTELLIGENCE

The Institute is an international clearing house of agricultural information, trade and statistics, a State institution made up of fifty-five adhering countries.

The Canadian Commissioner furnishes the Institute the information needed concerning Canada, and in this connection solicits the active co-operation of all the readers of this section. It is particularly desired that duplicate copies of articles to be published in current periodicals or reports summarizing results of original research and investigations of universal interest, be sent to the Canadian office for communication to the Institute, to be available for publication in one or other of its three original monthly bulletins. Similarly, duplicate copies of all agricultural reports and writings, whether official or not, are requested for the Rome and Ottawa libraries.

The Canadian Commissioner makes available to Canadians information published by the Institute, for which purpose this section of THE AGRICULTURAL GAZETTE is published monthly. It contains articles and summaries from the original Institute publications. Owing to lack of space many articles are merely indicated, but may be secured upon application to the Commissioner.

Similarly, the Canadian office cheerfully collaborates with anyone desiring to investigate details of foreign agricultural methods and processes, legislation, organization or administration. The Institute library at Ottawa, which has been made as nearly as possible a reproduction of the great International Agricultural Library at the headquarters of the Institute, Rome, now contains about 35,000 books, reports and pamphlets, and a reference catalogue of some 165,000 cards, which includes a complete set of the cards of the U. S. library of Congress referring to agriculture. There are also some 350 periodicals, a great many of which are indexed by the H. W. Wilson Agricultural Index and are consequently easily available for the investigation of current questions. Anyone who may be unable to visit the library in person may write to the Commissioner who will, if desired, have appropriate bibliographies and memoranda prepared on any given subject.

All communications in regard to this section should be addressed to T. K. Doherty, International Institute Commissioner, Department of Agriculture, West Block, Ottawa.

	Per annum
International Review of Agricultural Economics.....	18 francs
International Review of the Science and Practice of Agriculture.....	18   “
International Crop Report and Agricultural Statistics.....	6   “
The Three Bulletins together. ....	36   “

## SCIENCE AND PRACTICE OF AGRICULTURE

## GENERAL INFORMATION

- 517—Agriculture and Stock Breeding in Uruguay.—Report received from Dr. ENRIQUE JOSE ROVIRA, Uruguayan Delegate to the International Institute of Agriculture (extract from a Report by the engineer SOCRATES S. RODRIGUEZ). (8 pp. in Institute Bulletin).

- 519—Courses of Practical Agricultural Engineering in Italy and France.—I. TOSCANO, DARIO, Course of practical agricultural engineering in Sicily, in *Il Coltivatore*, Year 63, No. 12, pp. 394-395. Casale Monferrato, April 30, 1917. —II. School for drivers of agricultural machines, in *Le Progrès Agricole et Viticole*, Year 34, Vol. 67, No. 8, p. 189, Montpellier, February 25, 1917.

## CROPS AND CULTIVATION

- 521—A Study of Climatic Conditions in Maryland (United States) as Related to the Growth of the Soy-Bean.—MCLEAN, FORMAN T., in *Physiological Researches*, Vol. 2, No. 4, pp. 129-208, 14 fig. Baltimore, February, 1917. (2 pp. in Institute Bulletin).

- 522—The Reaction Between Dilute Acids and the Phosphorus Compounds of the Soil.—RUSSELL, E. J., and PRESCOTT, J. A., in *The Journal of Agricultural Science*, Vol. VIII, Part 1, pp. 65-110 + 9 fig. Cambridge, 1916.

- 525—The Use of Dog's Tooth Grass (*Cynodon Dactylon*) for Binding Shifting Sands in Sicily.—BORZI, A., in *Bollettino di Studi ed Informazioni del R. Giardino Coloniale di Palermo*, Vol. III, pt. 3-4, pp. 101-116 + 2 plates. Palermo, 1916.

- 526—The Rapid Increase in the Output of American Potash.—Commerce Reports, No. 45, p. 728. Washington, D.C., February 23, 1917.

Greatly increased production of potash in the United States of America during 1916 is reported by the United States Geological Survey, which also expressed the belief that the output for 1917 will be much greater. The total production of potash salts and potash products in the United States in 1916 represented about 10,000 short tons of pure potash, with a net value at point of shipment of at least \$3,500,000 figured at the prevailing selling prices. This is ten times the value of the production reported for 1915, but the figures submitted by many of the producers represent only a start made towards the end of 1916.

The production of potash reported to date for 1916 may be summarized as follows:

Mineral sources: Natural salts or brines, 3,850 short tons; alunite and silicate rocks, including furnace dust recoveries, 1,900; total mineral, 5,750.

Organic sources: Kelp, 1,110; pearlash (mostly from hardwood ash), only 23 producers having reported to date out of a list of 70 establishments said to be producing, 220; miscellaneous industrial wastes, 1,750; total organic, 3,080.

Total output, 8,830 short tons.

The largest output has come from the Nebraska alkali lakes, but the natural saline deposits elsewhere are now just beginning to make important contributions. The figures for potash derived from alunite, of which there is only one important producer, are combined with those for available potash in cement-kiln, fluedust, greensand, and feldspar recoveries, in order not to disclose figures given in confidence. These do not include a considerable quantity of feldspar said to have been mined and prepared for possible use for the sake of the potash it contains. The production of potash from organic sources is about half that from mineral sources. The recovery of potash from pearlash is an old established industry.

- 528—The Addition of Tar to Calcium Cyanamide to Facilitate Spreading: Experiments made in Germany.—SCHMOEGER and LUCKS, in *Mitteilungen der Deutschen Landwirtschafts-Gesellschaft*, No. 10, pp. 156-157, Berlin, March 10, 1917. (2 pp. in Institute Bulletin).

- 529—The Use of Lead for Stimulating Growth in Plants; Manuring Experiments in Germany.—STUTZER, A., in *Journal für Landwirtschaft*, Vol. 64, Pt. 1 and 2, pp. 1-8. Berlin, 1916.

- 532—The Formation and Disappearance of Saccharose in the Beet.—COLIN, H., in *Revue générale de Botanique*, Vol. XXVIII Parts 334, 335, 336, pp. 289-299, 322-328, 368-380; Vol. XXIX, Parts 337, 338, 339, 340, pp. 21-32, 56-64, 89-96, 111-127. Paris, 1916-1917. (2 pp. in Institute Bulletin).

533—The Influence on Germination of the Hot Water Treatment of Cereal Seeds for Smut.—LAKON, GEORG, in *Zeitschrift für Pflanzenkrankheiten*, Vol. 27, Pt. 1, pp. 18-25. Stuttgart, February 15, 1917 (2 pp. in Institute Bulletin).

535—Pure Lines in Self-Fertile Plants Probably Unalterable by Selection.—FRUWIRTH, C., in *The Journal of Heredity* Vol. VIII, No. 2, pp. 90-94, 1 fig. Washington, D.C., February, 1917. (2 pp. in Institute Bulletin).

540—Experiments with Spring Cereals at the Eastern Oregon Dry-Farming Substation, Moro, Oregon.—STEPHENS, DAVID E., in *U. S. Dept. of Agriculture, Bulletin* No. 498, 37 pp., 16 fig. Washington, February 19, 1917. (3 pp. in Institute Bulletin).

541—Studies on Wheat in the Province of Rovigo, Italy.—BERTONI, G., in *Il Coltivatore*, Year 63, No. 10, pp. 327-332, 3 fig. Casale Monferrato, April 10, 1917.

542—Results of Trials in 1916 at the German Station for Potato Growing.—VON ECKENBRECHER, E., in *Zeitschrift für Spiritusindustrie*, Year 1917, Supplementary No. pp. 1-57. Berlin, 1917. (3 pp. in Institute Bulletin).

543—Sweet Potato Culture in the United States and in Sicily.—I JOHNSON, T. C., and ROSA, J. T., Jr., Sweet Potato Culture, in *Virginia Truck Experiment Station, Bulletin* 19, pp. 387-415. Norfolk, Virginia, April 1, 1916.—II. BORZI, A., *The Batatas edulis* in Sicily, in *Bollettino di Studi ed Informazioni del R. Giardino Coloniale di Palermo*, Vol. III, Parts 3-4, pp. 118-127. Palermo, 1916. (3 pp. in Institute Bulletin).

544—Influence of the Time of Cutting on the Yield of Lucerne, in Italy.—MORETTINI, A., in *Le Stazioni Sperimentali Agrarie Italiane*, Vol. XLIX, Part II, pp. 541-562. Modena, 1916.

The best time for cutting meadow-land is known to be at the beginning of the

flowering period, but it is not always possible to effect it at this time and the majority of farmers prefer to postpone the time of cutting rather than to anticipate it.

In order to ascertain whether this practice is a good one, the writer undertook to study the effect of anticipating or retarding the 1st and 2nd cuts upon the yields from subsequent cuts. His researches were carried out in 1914-1915 upon land adjoining the "R". Istituto Superiore agrario sperimentale" at Perugia, situated on a gentle slope and arranged in wide strips the test plant used being lucerne grown without irrigation.

Summarising the results obtained during the 2 years' experiments it may be concluded that:

1) By advancing or postponing the cuts of lucerne on the normal time which corresponds to the beginning of flowering no increase in the total quantity of forage is obtained.

2) The largest quantity of forage is obtained by making various cuts at the beginning of flowering and before the new buds appear at the base of the plants.

In the localities where the experiments were made, the anticipation of the time of cutting lucerne has not increased the production of forage, contrary to the results obtained in other localities (Hohenheim, Proskau, Utah) and by other workers (Garola, Wolff, Foster and Merill). The present writer considers that this is to be attributed to the fact that in the Province of Perugia, the amount of rainfall is insufficient to produce a beneficial effect after the time of the 1st cut.

If it is impossible to make the cuts at the beginning of flowering, it will be less unfavourable to advance rather than to retard them; in the first case one only loses on the quantity of hay, whereas, in the second case, there is a diminution of the nutritive value also, and this decrease is greater the greater the delay.

554—Experiments on the Pollination of Fruit Trees.—CORRIE, LESLIE GORDON, in *The Journal of Heredity*, Vol. VII, No. 8, pp. 365-369, 1 fig. Washington, D.C., 1916. (2 pp. in Institute Bulletin)

## LIVE STOCK AND BREEDING

560—The Treatment of Overworked Horses and the Value of the Use of Glucose Serum in Intratracheal Injections.—MASOTTO, LEOPOLDO, in *Il Nuovo Ercolani, Rivista di Medicina Veterinaria*, Year XXII, No. 7, pp. 109-113; No. 8, pp. 125-130. Turin, April 15 and 30, 1917.

563—Tuberculosis of the Goat.—MOUSSU, M., in *Comptes rendus des Séances de l'Académie d'Agriculture de France*, Vol. III, No. 12, pp. 341-348, Paris, March 28, 1917.

564—The Nutrients Required to Develop the Bovine Foetus.—ECKLES, C. H., in *University of Missouri College of Agri-*



culture, *Agricultural Experiment Station, Research Bulletin* 26, pp. 1-36, 23 plates + 4 diagrams. Columbia, Missouri, November, 1916. (3 pp. in *Institute Bulletin*).

565—New Feeding-Stuffs used in Germany during the War.—KLING, M. (from the Agricultural Station of the Speyer district), in *Landwirtschaftliches Jahrbuch für Bayern*, Year 6, No. 11-12, pp. 483-513. Munich, 1916. (7 pp. in *Institute Bulletin*).

566—Experimental Researches on the Nutritive Value of Maize; Raw, Sterilized and Decorticated.—WEILL, E., and MOURIQUAND, G., in *Comptes Rendus des Séances de la Société de Biologie*, Vol. LXXX, No. 8, pp. 372-375. Paris, April 21, 1917.

567—The Propagation of Wild-Duck Foods.—MCATEE, W. L., in *United States Department of Agriculture, Bulletin* No. 465, 40 pp. 35 figs. Washington, Feb. 23, 1917. (2 pp. in *Institute Bulletin*).

Horse Breeding in the Argentine Republic.—MARTINOLI, G., in *International Review of the Science and Practice of Agriculture*, Year VIII, No. 6, pp. 819-825. Rome, June, 1917.

In the Argentine, as is well known, the horse owes its origin to a few animals abandoned by don Pedro de Mendoza two years after the foundation of Buenos-Aires (1537) and to those imported, a few years after, from Peru, Paraguay and Chili. The possibility of a type existing before Columbus, and descended directly from *Equus recidens*, though often discussed and recognized to be plausible, has not yet been sufficiently proved.

The horses imported originally by the Spaniards were of the Andalusian type; as a result of unchecked multiplication in the boundless pampa they gave rise to those innumerable semi-wild herds known as *cimarrones* or *baguales* which made such an impression upon the first writers who dealt with la Plata. So arose the *criolla* or creole race of primitive and hardy animals of which, for long years, man did not take the slightest care, allowing them to breed in conditions entirely natural and not always favourable. The result was that, as a result of its inadequate size and girth, the frequently excessive reduction of chest and lack of symmetry, the creole horse was obviously incapable of constituting the ideal type, necessary to the country when the general conditions of agriculture and stock-raising began to improve. There undoubtedly occurred, in various places, better built animals, of bigger size and more blood, which if properly selected,

might have given good results, but the Argentine breeders usually preferred to have recourse to crossing with breeding animals imported from Europe in their scheme for improving their live stock.

The importation of horses began to reach a certain importance towards the end of the 19th century. During the period 1900-1914 the number imported was 7130, the chief breeds being the Thoroughbred, Percheron, Clydesdale and Hackney.

In the Argentine it has too often happened that breeders, either out of their own conviction or for some particular interest, have followed completely opposite methods, some being immense enthusiasts for English thoroughbreds, others for the Hackney, the Anglo-Norman, the Yorkshire Coach, etc. The result is a continual changing of ideas which has inevitably led to the present state of affairs.

The Argentine possesses a considerable number of excellent English thoroughbreds for stud purposes; the following stallions may be quoted which have either been or are still being used: Flying Fox, Diamond Jubilee, Jardy, Ormonde, Pietermaritzburg, Cyllene, Polar Star. Nor is there a lack of types for crossing, such as Val d'Or. Unfortunately, this magnificent material is devoted entirely to the interests of the turf, very popular in the country. It would, however, have allowed of the formation of a magnificent collection of half-breeds adapted to various needs, whereas what actually exists is incomparably less important than what might and undoubtedly will be obtained eventually. In view of these antecedents, there is no room for astonishment if, notwithstanding the large number of horses existing in the country, it is difficult to obtain homogeneous lots of any importance. The admission is not a very satisfactory one to make and yet, in spite of everything, we have faith in the future of the Argentine in this respect and that for the following reasons:

In order to arouse the energy and latent capacity of breeders a recognised international market is required, one sure of paying good prices and capable of affording a clear index of requirements. After the present world conflagration this market is bound to be established, and there will then ensue a rapid transformation of this branch of animal production. In subsequent articles, treating of the production of cattle and sheep in the Argentine, we shall be able to prove that the existence of a definite and lucrative market has been the direct cause of improvements occurring in the breeding of both these classes of animals. Even with regard to horse-breeding, however, we can cite an example which affords abundant support of the opinion expressed above.

Hitherto the breeding of cart-horses has

not been influenced by any idea of an external market but has been obliged to respond to the ever-increasing demands of agriculture, industry and trade.

Requirements in the shape of ordinary saddle and light draught animals, army horses, etc., have always been relatively easy to satisfy owing to the large number of horses available relatively to the limited requirements along these lines. On the other hand, with regard to cart horses, it was a question of building up a type which absolutely did not exist and which must fulfil actual, positive requirements.

A start was thus made, first with Shires and Clydesdales, then with Percherons, and soon the number of pure-bred and half-bred animals was considerable. At the present time the majority of cart-horses, in the large towns of the Argentine are sound Shire and Clydesdale crosses, heavy animals showing the characteristics of these English breeds.

The turn of the Percherons has come relatively recently and already their success has surpassed that of the Clydesdales. The Percheron, in fact, is the real farm-horse which was wanted. It is the post-horse type which gives the best results: ample in stature and girth, hardy, strong, hardworking, it is adapted equally well both to the slow work of ploughing and to more rapid carting work, etc. If necessary, it goes well between the shafts of a country conveyance. It has been remarked, besides, that the offspring of crosses between these Percherons and good native mares of sufficient stature and muscle often gave excellent all-round animals, in great favour in the country and also for artillery.

At the exhibitions of the "Sociedad Rural Argentina" and also at provincial shows, one can often admire a really striking collection of these heavy animals. On the other hand, Boulonnais and Belgian horses have not yet found a favourable environment, and the same may be said of the Suffolk Punch.

Horse-breeding in the Argentine is characterized by the system of free pasturage. With the exception of valuable pedigree animals, reared in *cabanas*, and of horses employed in the large urban centres, all horses live continuously in the open, exposed to the inclemencies of the weather and the vagaries of the seasons. The horses of the first category are given various rations, almost always including: hay—maize or oats—bran, etc., but the overwhelming majority live exclusively on natural pastures or lucerne. Notwithstanding this free kind of life and feeding, the animals usually remain in good condition and work well, especially where the *pastos* (pastures) are rich and of the *tiernos* (tender) type or in the *alfalfares* (lucerne fields) zone. Speaking from our own experience, we may say that good Percheron crosses, employed throughout the year on

ploughing work, seeding, harvesting and carting grain, etc., and fed exclusively on the lucerne from *potreros* (enclosures) in which they are shut after work, keep in excellent condition and work hard and well.

In the *pampa* horses go unshod as stones or any other similar obstacles are completely absent, and the hoof wears down very slowly and does not split. The grooming leaves a fair amount to be desired, frequently the only attention given is to put the stallion with a certain number of mares at rutting time. An almost universal character among Argentine horses is their extreme docility once they have been broken in and trained to work.

Apart from the prizes offered at race-meetings and country exhibitions, and a certain number of purchases made by the Jockey Club for army purposes, there are no other forms of encouragement worth mentioning.

As stated above, in normal times prices have never been very good, and consequently many breeders, especially those interested in light-draught and saddle horses, have preferred to relinquish horses and devote themselves to fattening cattle.

569—Live Stock Production in the Eleven Far Western Range States, U.S.A.—BARNES, WILL C. and JARDINE, J. T., in *U. S. Dept. of Agriculture, Office of the Secretary, Report No. 110*, 100 pp. Washington, July 1, 1916. (4 pp. in Institute Bulletin).

570—Hereditary Transmission of the "Curly Wool" Character of Karakul Sheep in Crosses between the Karakul and Rambouillet Breeds; Research carried out in Austria.—ADAMETZ, LEOPOLD, in *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, Vol. 17, Pt. 3, pp. 161-202. Leipzig, March, 1917.

Breeders of Karakul sheep of the Bokhara district (Central Asia), as well as most fur merchants of central Europe, consider the lock of Karakul lambs to be a specific product of their native habitat, outside which this character is not maintained. This was also Darwin's theory.

In order to clear up this point and to gain a better knowledge of the inheritance of the curl, crossings between Karakul sheep and Rambouillet sheep (whose lambs have straight wool) were carried out at the experimental farm of the High School for Agriculture at Gross-Enzersdorf (Austria). Unfortunately the experiments were unavoidably carried out under rather unfavourable conditions: as only 50 animals were available, only pure-bred Karakul rams were crossed with pure-bred Rambouillet ewes. In spite of their deficiencies, the experiments permitted the determination of the principal factors in the inheri-

tance of the Karakul curl. The results were compared with those obtained by other breeders from crosses between the Karakul and Zackel breeds.

RESULTS OF THE EXPERIMENTS.—1) The Karakul curl is a strictly hereditary character which is transmitted even if Karakul sheep are crossed with other races of which the lambs have wool which does not curl.

2) With regard to this character such crossings produce characteristic Mendelian segregations.

3) The capacity of Karakul sheep to form these typical locks is, therefore, a character which is never caused by the natural conditions of the Bakhara district, but is rather a phenomenon of domestication due to a mutation.

4) The capacity of forming Karakul locks is probably an incomplete dominant character in the Mendelian sense, as is the case with curls in certain human hair.

5) The incomplete dominance of the formation of curls is also seen by the fact that, already in the hybrids of F<sub>1</sub>, the fleece of the lambs varies greatly; some of the animals have no curls, others have curls like those of pure-bred Karakuls of the first quality, and there are all kinds of intermediate animals.

6) With regard to the hereditary force of curl formation, especially in the F<sub>1</sub> generation the results vary in the different Karakul rams; this may be attributed to the individual strength of the animals.

7) The extent of curl formation in the lambs of the F<sub>1</sub> generation depends also, all else being equal, on the second race without curls chosen for crossing. Breeds with mixed wool, especially of the Zackel breed give, very good quality curls in F<sub>1</sub> generation; on the other hand, Merino sheep give bad quality curls. The absence of curls in the fleece of lambs derived from crossing Karakul and Rambouillet breeds is the result of atavistic crossings.

8) As the curls only appear in very young animals, their formation may be described as an incomplete and temporary dominant.

9) The varying behaviour of the hairs which form the curl at the different stages of the development of the fleece leads to the supposition that there is a close rela-

tionship between curly flat-lying hair on the one hand and curly, vertical hair and very wavy and slightly wavy hair on the other.

10) It is clear that the shape of the lower part of the follicle cannot be the cause of this varying behaviour of the hairs.

11) The mode of action of the mechanical forces during the formation of Karakul curls is not known.

12) The histological character of the different kinds of hair cannot, therefore, form a practical base in the choice of factors.

13) Unlike the less complete curls in human hair due to one factor only (in the white race, according to Davenport), or, at the most to 2 factors (in Hottentots with very curly hair, according to Fischer), the appearance of the Karakul curl, so far as can be judged by the results obtained, is probably caused by more than 2 factors.

14) If the manner in which the locks are transmitted within the pure-bred Karakul race itself is considered, it appears probably that a great many factors are concerned, all of which act in the same sense ("polymerism"), according to Nilsson-Ehle's theory.

15) The hypothesis that the capacity of forming curls in the Karakul race depends on a large number of factors acting in the same sense is corroborated by the fact that in the more complicated crossings made by the author (F<sub>2</sub> × F<sub>2</sub> and F<sub>1</sub> × F<sub>2</sub>), there were often lambs whose fleece pointed to a sort of intermediary inheritance.

16) This explanation is contradicted by the fact that, even after repeated reciprocal crossings on the Karakul side, there still appear from time to time lambs without curls. This is probably a case of heterozygotes of a recessive type. The author considers improbable Davenport's hypothesis, that there exists a force which exercises a different activity, and, according to the circumstances, can cause these incompletely dominant characters to develop or else leave them in the latent state.

571—The Cost of Raising Leghorn Pullets.

—PHILIPS, A. G., in *Purdue University Bulletin*, Vol. IX, No. 196, 20 pp., 6 fig. Lafayette, Indiana, December, 1916. (2 pp. in Institute Bulletin).

## FARM ENGINEERING

574—Ploughing with a Tractor.—RINGELMANN, MAX, in *Journal d'Agriculture pratique*, Vol. 29, No. 25, pp. 435-438, 4 fig.; Vol. 20, No. 6, pp. 103-106, 5 fig. Paris, Dec. 14, 1916, and March 22, 1917. (3 pp. in Institute Bulletin).

575—Tractor Plough Adjustments and

Hitches.—REED, C. O., in *Farm Implementation News*, Vol. XXXVIII, No. 9, pp. 26-27, 6 fig. Chicago, Illinois, March 1, 1917. (2 pp. in Institute Bulletin).

577—A Touring Car converted into a Tractor.—RINGELMANN, MAX, in *Bulletin de la Société d'Encouragement pour l'In-*



*dustrie Nationale*, Year 116, First Half-year, Vol. 127, No. 1, pp. 214-215, 1 fig. Paris, January-February, 1917.

578—The Jullien Tool-holder for One-armed Men.—RINGELMANN, MAX, in the *Bulletin de la Société d'Encouragement pour l'Industrie Nationale*, Year 116, 1st Half-year, Vol. 127, No. 1, pp. 16-25, 14 fig. Paris, January-February, 1917.

An apparatus for the purpose of enabling one-armed men to use the various agricultural implements such as spades, forks, etc.

The inventor has also designed for men having lost their fore-arm, a hammer-carrier with an anti-vibratory support which replaces the suppleness of the wrist and elbow and allows the one-armed man to hammer nails, etc. A rigid apparatus would tire the man very much and cause pain to the injured arm.

For planting out plants, M. Jullien has

devised a simple spring-clip which is fixed at the end of an ordinary apparatus for a one-armed man.

579—The Width of Wagon Tires Recommended for Loads of Varying Magnitude on Earth and Gravel Roads.—MCCORMICK, B. E., in *United States Department of Agriculture, Circular No. 72*, 6 pp. Washington, February 12, 1917.

The recommendations in this circular are based on two factors: 1) the unit weight for width of tire commonly used for road rollers, and 2) the results secured from a large series of traction tests conducted by the Office of Public Roads and Rural Engineering, extending over several years and made in widely scattered localities throughout the United States.

The following are the tire widths recommended for wagons of different carrying capacities.

Type of wagon	Gross weight loaded	Width of tire
1 horse-wagon.....	2,000 lb	2 inches
Light 2-horse wagon.....	3,500 "	2.5 "
Medium 2-horse wagon.....	4,500 "	3 "
Standard 2-horse wagon.....	6,800 "	4 "
Heavy 2-horse wagon.....	7,500 "	5 "

582—Purifier for Rain Water.—GRANDERYE, L. M., in *La Vie agricole et rurale*

Year 7, No. 13, p. 227, 2 fig. Paris, March 31, 1917.

## RURAL ECONOMICS

583—Methods and Cost of Growing Beef Cattle in the Corn Belt States.—COTTON, J. S., COOPER, MORTON O., WARD, W. F., and RAY, S. H., in *U. S. Department of Agriculture, Office of the Secretary, Report No. 111*, pp. 1-64. Washington, July 1, 1916.

This study represents Part III of an investigation into the production and consumption of meat organized by the Secretary of Agriculture. The data were collected from 595 farms representative of the agricultural situation in the Corn Belt, in the following states:—Illinois, Iowa, Missouri, South Dakota, Nebraska, Kansas, Minnesota and Indiana. Cattle-breeding is the most important branch of agriculture in this district, in Minnesota, 29% of the total farm area is pasture, and in Indiana 65%.

Table I summarises the data collected in each state concerning the size of the farms, their division into pasture, corn, small grain and hay, and their average value per acre.

The chief object of the investigation was to determine as accurately as possible the

cost of producing beef animals. With this end in view the records were divided into 6 groups based on the 6 distinct practices followed in general by the farmers.

GROUP I (Beef).—Farms where all the cows are kept strictly for beef (not including farms producing baby beef). On a number of these farms enough milk was taken from 2 or 3 cows of the best milkers to supply the family with milk and butter. In such instances the milk and butter credits have been ignored as it was found that the value of the extra labour in milking and caring for the calf, and of the extra grain given, usually offsets the value of these milk products.

GROUP II (Baby Beef).—Farms on which the breeding herds are maintained for the production of high-grade calves, which are fattened on the same farm and sold at from 12 to 18 months of age as baby beef.

GROUP III (Dual Purpose).—Farms on which all the cows are milked, and either cream or butter sold, the calves being weaned at birth and raised on skim milk.

GROUP IV (Mixed).—Farms on which the best cows are milked, their calves being weaned at birth and fed skim milk. The calves from the other cows are allowed to run

with their dams as in the beef group.

GROUP V (Partially milked).—Farms on which the calves are not weaned, but on which a part of the milk is drawn from the cow, the calf taking the remainder. There are a number of variations of this practice. One of these is to allow the calves to run with their dams during the day, but to keep them in a separate inclosure at night, the cows being

milked in the morning. Another common practice is to keep the calves separate and allow them to take the bulk of the milk twice daily, the remainder being taken for household and market purposes.

GROUP VI (Double nursing).—Farms where some of the cows are milked and their calves given to other cows, the latter raising two calves each.

TABLE I.—The average size and value of farms visited and the percentage of each in pasture, corn, small grain and hay, by States:

State	No. of farms	Average size of farms	Area in pasture		Area in corn		Area in small grain		Area in hay		Value of land
		acres	acres	%	acres	%	acres	%	acres	%	per acre
Indiana (1914).....	23	294	191	65	43	15	16	5	25	9	\$ 59
Illinois (1914).....	21	294	158	54	60	20	32	11	38	13	129
Minnesota (1914-15).....	60	357	104	29	85	24	66	18	51	14	125
Iowa (1914-15).....	219	301	93	31	85	29	54	18	38	13	175
Missouri (1914-15).....	78	356	179	50	53	15	36	10	71	20	82
South Dakota (1914).....	14	511	180	35	146	29	90	18	75	15	97
Nebraska (1914-15).....	66	380	116	31	105	28	74	19	53	14	132
Kansas (1914-15).....	114	566	326	57	79	15	62	11	69	12	780

It may be seen that, in all these groups, animal production is based on the breeding herd, which remains almost constant. Table II shows the average importance of breeding cows in the 6 groups.

The cost of beef production was estimated by the following method: First of all the annual gross cost of maintaining each breeding cow and each bull was determined. The net profit was then estimated, including milk and manure, but excluding the calves. Next the percentage of baby beef in proportion to the number of cows and

bulls was calculated. The net cost of the cows and bulls was divided in proportion to these percentages. The average cost of the calves until weaning time on the different groups of farms was thus obtained. In determining the cost of production for one year the following factors were taken into consideration:—food, labour, equipment, interest, risk, taxes, insurance and veterinary expenses. The costs thus obtained were compared with the inventory or sale values.

TABLE II.—The size of the herds in each of the different groups:

Group	Number of farms	Cows		Bulls	
		Total no.	Average no.	Total no.	Average no.
I.....	230	7246	31.50	255.5	1.11
II.....	66	2281	34.56	81	1.23
III.....	110	1403	12.75	103.25	0.94
IV.....	102	2394	23.47	101	0.99
V.....	65	929	14.29	60.5	0.92
VI.....	22	381	17.32	20	0.91
General average.....	595	14634	24.55	621.25	1.04

Table III gives data concerning the average gross cost of keeping cows in the 6 different groups, and the net and relative cost, including milk and manure, but excluding calves. In a similar way the cost of bulls was determined, and the cost of calves up to one year by the method described above.

Table IV summarizes the results of these calculations as compared with the cost of production. In considering the records of the two years 1914-1915, it should be noted that the rather low average is due to the unsatisfactory results of the first year, caused by drought. The data obtained indicate that the keeping of cattle for beef purposes alone is adapted to the more ex-

tensive types of farming, while the keeping of cattle primarily for beef purposes, but where an income is also obtained from milk products, is better adapted to the more intensive types of farming. When estimating the profits obtained by raising calves on corn belt farms the following facts must be taken into consideration: 1) Good returns have been obtained for a large quantity of roughage which would otherwise have been wasted; 2) a home market has been provided for saleable crops; 3) on many farms a large acreage suitable to pasture only has been utilized; 4) profitable employment is provided for a season of the year when labour otherwise might be idle; 5) a return is obtained for capital

TABLE III.—Average gross cost of keeping a breeding cow in the 6 groups, and net cost:

Groups	Number of farms	Average cost per cow												Total net cost, including milk or butter and manure (excluding calves)
		Number of cows	Feed charges			Labour	Equipment	Interest	Risk	Taxes	insurance (70% of the farms)	Veterinary	Total gross cost	
			Summer	Winter	Entire Year									
I.....	230	7246	8.20	16.49	24.69	3.88	1.75	3.83	.43	.34	.06	.14	35.12	30.33
II.....	66	2281	9.11	17.19	26.30	3.11	2.25	4.16	.43	.31	.10	.11	36.77	31.38
III.....	110	1403	7.90	24.15	32.05	15.23	3.32	3.60	.43	.31	.07	.13	55.14	6.07
IV.....	102	2394	7.43	20.30	27.73	9.03	2.37	3.90	.43	.32	.07	.10	43.95	19.23
V.....	65	929	8.08	17.97	26.05	9.84	2.23	3.59	.43	.40	.07	.14	42.75	21.32
VI.....	22	381	8.50	20.39	28.89	9.80	3.01	3.82	.43	.33	.05	.17	46.50	13.24

invested in equipment which, in many instances, were it not utilized by live stock, would return nothing; 6) the farmer makes at least 6% interest on the money he has invested in the cattle business.

It should be noted that the greatest profits were yielded by Group VI, the double-nursing group. Although this system is adopted by a small number of breeders

only and only 22 records were procured, it gave the lowest cost of production both for calves at the time of weaning and for yearlings. This result is largely due to the milk credits, which were obtained without extra labour other than milking. It is also due to a larger percentage of calves produced by the cows, and to a larger proportion of the records being taken in the more favourable year of 1915.

TABLE IV.—Summary table showing for the 6 groups the various factors that make up the cost of producing a yearling.:

Item	Group I	Group II	Group III	Group IV	Group V	Group VI
Number of farms.....	230	66	110	102	65	22
Average number of cows per farm.....	31.50	34.56	12.75	23.47	14.29	17.32
<i>Cost of maintaining the breeding herd:</i>						
Gross cost of maintaining a cow.....	\$35.12	\$36.77	\$55.14	\$43.95	\$42.75	\$46.50
Credits other than cow.....	4.79	5.39	49.07	24.72	21.43	33.26
Net cost of maintaining a cow.....	30.33	31.38	6.07	19.23	21.32	13.24
Net cost of maintaining a bull.....	42.27	53.26	37.51	46.79	34.14	40.53
<i>Calf crop:</i>						
Percentage of cows raising calves to weaning time.....	84.9	90.7	83.9	87.5	90.1	92.1
Number of calves per bull.....	20.9	25.3	10.7	18.5	12.6	15.0
<i>Cost of raising a calf to weaning time:</i>						
Cow charge.....	35.47	34.50	7.34	22.29	23.71	14.53
Bull charge.....	2.26	2.29	4.02	2.91	3.55	3.02
Feed, including pasture.....	0.01	—	9.35	4.48	0.02	0.26
Labour.....	—	—	2.56	1.11	—	0.01
Total cost at weaning time.....	37.74	36.79	23.27	30.79	27.08	17.82
<i>Cost of raising a yearling:</i>						
Number of farms.....	190	67	99	96	57	22
Average number of calves per farm.....	24.43	30.20	10.57	18.46	11.16	14.23
Cost at weaning time.....	38.20	37.01	23.64	30.61	26.39	17.82
Winter-feed cost.....	12.32	35.02	9.93	12.01	12.21	10.24
Other charges.....	4.62	6.02	4.92	4.72	4.66	3.86
Gross cost.....	55.14	78.05	38.49	47.34	43.26	31.92
Credits (manure).....	1.60	7.53	1.89	1.48	1.54	1.67
Net cost at 1 year.....	53.54	70.52	36.60	45.86	41.72	30.25

## AGRICULTURAL INDUSTRIES

587—Changes in Fresh Beef During Cold Storage Above Freezing.—HAGLAND, R., MCBRYDE, CH. N., and POWICK, W. C., in *U. S. Department of Agriculture, Bulletin* 433 (Professional Paper), pp. 1-100. Washington, February 15, 1917. (3 pp. in Institute Bulletin).

588—Investigations into the Changes undergone by Eggs.—LINDET, in *Comptes rendus des Séances de l'Académie d'Agriculture de France*, Vol. III, No. 11, pp. 320-329. Paris, March 21, 1917. (2 pp. in Institute Bulletin).



## PLANT DISEASES

594—Silver Nucleinate, a Substitute for Copper Sulphate in the Control of Vine Mildew.—VON DEGEN, A., in *Allgemeine Wein-Zeitung*, Year 34, No. 4, pp. 25-28. Vienna, January 25, 1917.

597—On the Appearance of Puccinia glumarum (Yellow Rust) on Wheat in 1914 and 1916 in Germany.—MULLER, H., and MOLZ, E., (Communication from the Phytopathological Station at Halle a. S.), in *Fuhling's landwirtschaftliche Zeitung*, Year 66, Part 2, pp. 42-45. Stuttgart, January 15, 1917.

On account of the several attacks of the yellow rust of cereals on wheat in April and May, 1916, the writers sent a series of questions to the farmers in the phytopathological district of Halle, in order to determine the amount of damage caused by the rust. A similar series had already been distributed in 1914. The comparison of the two series of replies allows the writers to draw the following conclusions.

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## AGRICULTURAL ECONOMICS

## REGULATION OF THE FRUIT TRADE IN THE UNITED STATES.

For several years there has been in the United States a movement towards giving a more stable basis to the trade in fruit and vegetables so as to simplify to a great extent the relations between the producer and the buyer. Congress and the Assemblies of several States have taken the matter up and have sought to standardize the various products, if not for a whole State at least for the whole territory of a county, and to determine the shape, kind and dimensions of standard receptacles in which they are transported, so that a merchant knows exactly, having the guarantee of State inspection, the weight and quantity of fruit in any box or other package which he receives.

The importance of such measures has been similarly recognized in other countries, such as Canada and Australia, where also the fruit trade is regulated for the prevention of frauds at the expense of merchants or consumers and the simplification of transactions of purchase and sale.

The Californian law, which we will presently analyse, has considerable bearing not only on trade but also on the production of the State in general. The fixing of standards results in closing the foreign market to defective fruit; and growers therefore seek to improve the average quality of their products by choosing more carefully the varieties grown and by more scientific culture. Hence will result an increase in the horticultural wealth of the State.

No forecasts can be made as to the future development of these ideas in the many States of the Union, but the interest taken in the matter by the Federal Department of Agriculture allows the supposition that the example of California will be followed in other fruit-growing regions.

As now organized the production of perishable fruit and vegetables is a highly specialized agricultural industry. It is concentrated to a large extent in certain localities but it is conducted mainly on a small scale. Many of the regions especially devoted to fruit growing are situated far from markets. The industry in this specialized form came into existence when the growth of great cities necessitated the drawing of supplies of perishable food from larger areas than those comprising the farms in the cities' immediate neighbourhood, and when railroads made the utilization of this larger area possible. Areas for producing perishable food have now been extended into the extreme south and south-west. Of approximately 100 million tons of farm produce annually transported by train about 20

million tons are perishable. Public authorities, growers and merchants have already for many years studied, each from their own point of view, the problems inherent in the transport and sale of these perishable products.

*a) Production.*—Perishable fruits and vegetables are grown on a relatively small scale while the large aggregate demands of the great market centres have brought into existence dealers who handle such produce only in large lots. This fact and the recognition that many other problems of marketing these goods could be solved only by giving the producers some of the advantages of operations on a large scale led the Office of Markets and Rural Organization early in its work to advocate the co-operative organization of growers wherever conditions were favourable.

*b) Preparation for Transport.*—Perhaps the most serious losses in this trade are due to unseasonable picking of the fruits and vegetables or their improper handling after they are ready to be marketed. The products are handled roughly and their decay on the way to the market is thus facilitated. Careful grading of the harvested products is also essential if they are to secure a reasonable price. And not the least of the problems connected with this trade is that of the packing of these perishable goods and of selecting for them suitable receptacles, of the proper type and dimensions, which will give them adequate protection and an attractive appearance and will not be too costly.

Another step which can be taken with profit, when certain valuable products are to be transported under refrigeration over long distances, is the precooling of the packed fruits or vegetables by blasts of very cold air immediately before or just after they have been placed in the refrigerator cars. When perishable goods are stowed at their normal temperature in a refrigerator car the limited quantity of ice used does not chill them for several days. As a result they continue to ripen and in many cases begin to decay. Precooling obviously cannot be practiced by individual consignors on a small scale but it would be profitable in many cases to co-operative associations. It has proved particularly valuable to such of these associations as transport oranges from California across the continent.

The Office of Markets and Rural Organization finds that the producer may grow and even develop varieties of fruit or vegetables which will remain in good condition for long periods and stand better than the

usual varieties the delays and rough handling to which consignments may be subjected before they reach the consumer.

c) *Sale*.—The losses of perishable fruits and vegetables are not due solely to the mechanical operations of marketing—the handling at producing points, on cars and at the market. The intangible machinery of supply and demand causes the heaviest losses, bringing about violent fluctuations of price and also gluts. One fact emphasized by the investigations of the Office of Markets and Rural Organization is that even when there is a severe general glut of a commodity that quantity of it which is really first-class can often be sold profitably. Indication of an impending glut should therefore cause the producer to grade more strictly than ever. Gluts due to faulty distribution can be prevented when it is possible to keep consigners accurately informed as to supplies at marketing points. By surveys of producing areas and market centres the Office of Markets and Rural Organization has collected as many data as possible with regard to the supply of and demand for perishable produce. The normal consuming power of numerous markets for certain products has been ascertained and the data have been furnished to consigners with excellent results.

The advantages gained by standardized handling, grading and packing are strikingly shown by results obtained in the California citrus industry. Large losses accompanied almost every consignment to eastern markets in the earliest days of the industry, when practically all enterprise was individualistic. Many such losses were due to defective transport but an appreciable proportion to a failure properly to grade and pack the fruit. Co-operative organizations arose and undertook to a large extent the work of grading and packing. Losses were materially reduced but not to the point felt to be desirable. Investigations begun by the department shortly after 1900 disclosed the fact that careless picking was chiefly responsible for the remaining losses. Picking as well as grading and packing was then standardized throughout the industry, and losses were brought down to a very satisfactory minimum.

Recent investigations of the canteloupe industry by the Office of Markets and Rural Organizations showed the need of standardizing the handling of this product also. Losses were found to result on a failure carefully to select the melons for size and quality, on loose and unattractive packing and on the use of receptacles of haphazard sizes and shapes. Studies of the marketing of berries, peaches and other perishable products have further emphasized the general need for standardization.

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tion involved in the marketing of these perishable products the office has also gathered information as to the methods by which they are solved in various places. A bulletin as to this phase of marketing canteloupes has been issued, and bulletins on grading, packing and transporting other fruits and vegetables will follow. The office is also compiling a digest of State laws on standardization and on the weights and measures used in marketing.

It is believed that co-operative associations may be relied upon as important factors in bringing about a general adoption of standards for supplies and methods in marketing. Such organization can extend uniform practices over important provinces, and standardization on a larger scale can be effected through national organizations.

State and Federal legislation have to some extent applied the principles discovered and brought forward by the Office of Markets and Rural Organization, principles accepted alike by producers, dealers and consumers.

In 1912 Congress established a standard barrel to be used for apples in inter-State commerce. On 4 March, 1915, Congress passed an Act, which had force from 1 July, 1916, to fix a standard barrel for fruits, vegetables and other dry commodities; and on 31 August, 1916, a third Act, which has force from 1 November, 1917, fixed standards for "Climax" baskets for grapes and other fruits and vegetables, and fixed standards for baskets and other containers for small fruits, berries and vegetables.

Further on 12 March, 1915, an Act was passed in Delaware which amended chapter 21 of the State's revised code by provisions regulating the grading, packing, marking, transport and sale of apples. In California on 10 June, 1915, the legislature passed an Act "to establish a standard for the packing in the State of California of the kinds of fresh fruit specified in this Act, for sale or for transportation for sale, for interstate and foreign shipment, and to prevent deception in the packing; also to establish a system of inspection for the same". On 1 May, 1915, the Pennsylvania legislature passed an Act "regulating the sale, offering for sale or exposing for sale of vegetables, grapes and fruits; providing standard containers—baskets and trays—therefor; and imposing penalties".

a) *The Provisions of the Law*.—We will examine in more detail the Californian Act. It has been possible to observe its working for a year, and owing to the importance of fruit growing in California it has been the subject of much discussion.

The principal provisions of this law, passed on 10 June, 1915, and effective since 9 August, 1915, are as follows:

"There is hereby created and established a standard for the packing of fresh fruits,



TABLE III.—Average gross cost of keeping a breeding cow in the 6 groups, and net cost:

Groups	Number of farms	Average cost per cow												Total net cost, including milk or butter and manure (excluding calves)
		Number of cows	Feed charges			Labour	Equipment	Interest	Risk	Taxes	Insurance (70% of the farms)	Veterinary	Total gross cost	
			Summer	Winter	Entire Year									
I.	230	7246	8.20	16.49	24.69	3.88	1.75	3.83	.43	.34	.06	.14	35.12	30.33
II.	66	2281	9.11	17.19	26.30	3.11	2.25	4.16	.43	.31	.10	.11	36.77	31.38
III.	110	1403	7.90	24.15	32.05	15.23	3.32	3.60	.43	.31	.07	.13	55.14	6.07
IV.	102	2394	7.43	20.30	27.73	9.03	2.37	3.90	.43	.32	.07	.10	43.95	19.23
V.	65	929	8.08	17.97	26.05	9.84	2.23	3.59	.43	.40	.07	.14	42.75	21.32
VI.	22	381	8.50	20.39	28.89	9.80	3.01	3.82	.43	.33	.05	.17	46.50	13.24

invested in equipment which, in many instances, were it not utilized by live stock, would return nothing; 6) the farmer makes at least 6% interest on the money he has invested in the cattle business.

It should be noted that the greatest profits were yielded by Group VI, the double-nursing group. Although this system is adopted by a small number of breeders

only and only 22 records were procured, it gave the lowest cost of production both for calves at the time of weaning and for yearlings. This result is largely due to the milk credits, which were obtained without extra labour other than milking. It is also due to a larger percentage of calves produced by the cows, and to a larger proportion of the records being taken in the more favourable year of 1915.

TABLE IV.—Summary table showing for the 6 groups the various factors that make up the cost of producing a yearling:

Item	Group I	Group II	Group III	Group IV	Group V	Group VI
Number of farms.....	230	66	110	102	65	22
Average number of cows per farm.....	31.50	34.56	12.75	23.47	14.29	17.32
<i>Cost of maintaining the breeding herd:</i>						
Gross cost of maintaining a cow.....	\$35.12	\$36.77	\$55.14	\$43.95	\$42.75	\$46.50
Credits other than cow.....	4.79	5.39	49.07	24.72	21.43	33.26
Net cost of maintaining a cow.....	30.33	31.38	6.07	19.23	21.32	13.24
Net cost of maintaining a bull.....	42.27	53.26	37.51	46.79	34.14	40.53
<i>Calf crop:</i>						
Percentage of cows raising calves to weaning time.....	84.9	90.7	83.9	87.5	90.1	92.1
Number of calves per bull.....	20.9	25.3	10.7	18.5	12.6	15.0
<i>Cost of raising a calf to weaning time:</i>						
Cow charge.....	35.47	34.50	7.34	22.29	23.71	14.53
Bull charge.....	2.26	2.29	4.02	2.91	3.55	3.02
Feed, including pasture.....	0.01	—	9.35	4.48	0.02	0.26
Labour.....	—	—	2.56	1.11	—	0.01
Total cost at weaning time.....	37.74	36.79	23.27	30.79	27.08	17.82
<i>Cost of raising a yearling:</i>						
Number of farms.....	190	67	99	96	57	22
Average number of calves per farm.....	24.43	30.20	10.57	18.46	11.16	14.23
Cost at weaning time.....	38.20	37.01	23.64	30.61	26.39	17.82
Winter-feed cost.....	12.32	35.02	9.93	12.01	12.21	10.24
Other charges.....	4.62	6.02	4.92	4.72	4.66	3.86
Gross cost.....	55.14	78.05	38.49	47.34	43.26	31.92
Credits (manure).....	1.60	7.53	1.89	1.48	1.54	1.67
Net cost at 1 year.....	53.54	70.52	36.60	45.86	41.72	30.25

## AGRICULTURAL INDUSTRIES

587—Changes in Fresh Beef During Cold Storage Above Freezing.—HAGLAND, R., MCBRYDE, CH. N., and POWICK, W. C., in *U. S. Department of Agriculture, Bulletin* 433 (Professional Paper), pp. 1-100. Washington, February 15, 1917. (3 pp. in Institute Bulletin).

588—Investigations into the Changes undergone by Eggs.—LINDET, in *Comptes rendus des Séances de l'Académie d'Agriculture de France*, Vol. III, No. 11, pp. 320-329. Paris, March 21, 1917. (2 pp. in Institute Bulletin).

## PLANT DISEASES

594—Silver Nucleinate, a Substitute for Copper Sulphate in the Control of Vine Mildew.—VON DEGEN, A., in *Allgemeine Wein-Zeitung*, Year 34, No. 4, pp 25-28. Vienna, January 25, 1917.

597—On the Appearance of Puccinia glumarum (Yellow Rust) on Wheat in 1914 and 1916 in Germany.—MULLER, H., and MOLZ, E., (Communication from the Phytopathological Station at Halle a. S.), in *Fuhling's landwirtschaftliche Zeitung*, Year 66, Part 2, pp. 42-45. Stuttgart, January 15, 1917.

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"There is hereby created and established a standard for the packing of fresh fruits,

for interstate and foreign shipment, of the kinds specified in this Act. Any box, basket, package or container of fresh fruit of the kinds specified in this Act, which shall be packed and offered for sale or for transportation for sale, shall be packed in accordance with the specifications herein made. All deciduous fruits of the kinds specified in this Act when packed shall be practically free from insects and fungous diseases. All fresh fruit of the kind specified in this Act which shall be sold in bulk, or loose in the box without packing, shall be exempt from the provisions of this Act.

"All cherries packed in boxes or packages shall contain fruit of practically uniform quality and maturity and one variety only, except that such boxes or packages may contain more than one variety if such fact be plainly stamped on the outside of the box or package with the words "Mixed Varieties" with letters one-half inch high. Each box or package (of cherries) shall be stamped on the outside with the minimum weight of contents and name of variety or varieties. Peaches, apricots, pears, plums and prunes shall be of practically uniform size, quality and maturity. When packed in crates, packages or containers, made up of two or more subcontainers having sloping sides for the purpose of ventilation of the fruit therein, the fruit shall not vary in size more than ten per cent, and no layer below the top layer shall contain a greater numerical count than the top layer. Each box, crate, package, container or subcontainer shall be stamped upon the outside with the minimum weight of its contents,... shall bear in plain letters the name of the variety contained therein, .... shall also be marked .... with the approximate number of peaches in the box which shall be within four peaches of the true count. Grapes packed for table use shall be of uniform quality and maturity and shall be well matured and show a (determined) sugar content ... Each crate or other package (of such grapes) and containers therein shall bear in plain figures the minimum weight of contents .... Berries shall be packed in uniform packages. Canteloupes shall be placed in standard crates.

"All boxes, crates, packages or containers shall bear upon them, in plain sight and plain letters on the outside, the name of the orchard, if any, and the name and post office address of the person, firm, company, corporation or organization who shall have first packed or authorized the packing of the same, also the name of the locality where the fruit is grown.

"In counties having a county horticultural commissioner it shall be his duty and the duty of his deputies, acting as inspectors, which office is hereby created, to enforce the provisions of this Act.... In a city and county or in counties having no

county horticultural commissioner or deputy, it shall be the duty of the county board of supervisors, upon petition filed with them, to appoint inspectors. Said petition shall be signed by at least twenty-five bona fide fruit growers residing in that county or city and county. Upon the petition of twenty-five resident freeholders who are fruit growers or shippers of fruit, the county horticultural commissioner or board of supervisors... shall immediately remove said inspector for neglect of duty, malfeasance in office or general unfitness for office....

"Any person, firm, company, corporation or organization who shall knowingly pack, or cause to be packed, fruit of the kinds specified herein, in boxes, crates, packages, containers or sub-containers, to be offered for sale or transportation for sale, in wilful violation of this Act, shall be guilty of a misdemeanor."

b) *The Application of the Law.*—This law was originally drafted by a committee of interested growers and consigners in consultation with the State horticultural commissioner. It was amended many times but always by its friends.

Various counties had tried for some years to accomplish the desired regulation of packing by agreements with the growers, the transporting companies or both; but saving in the case of Eldorado and Placer counties their success was no more than partial or temporary. In Eldorado and Placer counties the voluntary associations of shippers and growers issued printed rules and diagrams which were posted in the orchard packing houses. The scheme worked exceedingly well where the shipping firms co-operated and refused any package below the standard, but otherwise the need of State authority for the inspectors was seen. The present law was largely based on experience of these regulations, and thus it emanated from the industry itself and public sentiment had been to some extent prepared for it.

The law has helped the grower because it has raised prices, largely as a result of the better standard reached by the fruit. It has helped the consumer and the general public because the improvement in quality has outweighed the increase in prices. It has benefited the transport companies who have received, with the better prices, more for their work, and have been able to show better profits to their stockholders.

The absolute impossibility of an examination by the inspectors of every packed box of fruit is apparent. The greatest good can be accomplished only when the fruit growers, packers and shippers themselves are in sympathy with the work and willing to co-operate with the inspectors by conforming to specifications. It was this co-operation of growers, packers and shippers with county horticultural com-

missioners, in San Joaquin, Fresno, Sacramento and other counties growing table grapes, which made possible last year an efficiently standardized packing of grapes resulting in splendid prices.

In the first year for which the law was in force about 20,000 carloads of fresh deciduous fruit were subject to its provisions. The experiment was entirely satisfactory, eastern buyers referring to the "marvellously scientific pack of California fruit". Thousands of crates of fruit were rejected, but the grade of the consignments was raised many per cent. with comparatively little injury to anyone and extremely low administrative costs. Many thousands of dollars were added to the industry.

*c) Suggested Modifications.*—The chief abuses which the law sought to remedy were the following: 1) Topping—a top layer of good berries conceals inferior berries; 2) Irregularity of size and of degree of maturity within one package; 3) Pest infection which in States having quarantine

laws results in the condemnation of whole consignments; 4) The mixing of varieties in one package; 5) Wrong and irregular marks; 6) Small content of sugar. In one year progress has been made towards preventing these abuses and the law has thus been shown to have great practical value.

At the Forty-Ninth State Fruit Grower's Convention, held at Napa in November 1916, some proposals were however made for completing and improving the regulation of the fruit trade. These were mainly: *a)* that all counties should by certain procedure be compelled to appoint inspectors *b)* that the different counties of the State should formulate uniform standards, thus introducing simplicity into the trade and allowing distant buyers to place orders at fixed prices for definite classes of goods; *c)* that packed fruit should be more precisely defined; *d)* that the law should apply to all consignments of fruit, including those intended for Californian markets; *e)* that some central authority should have complete control of the inspection of fruit.

## CONTENTS OF THE INSTITUTE ECONOMIC BULLETIN

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## AGRICULTURAL STATISTICS

## INSTITUTE CROP CABLE

Bumper world crops of corn, oats, potatoes, rice, sugar beets and tobacco for this year are shown by estimates compiled by the International Institute of Agriculture, made public November 24th. Wheat, rye, barley and flaxseed, however, have fallen below the five-year average of production from 1911 to 1915.

The production of wheat in seventeen countries, not including the Central Powers, will be 1,868,000,000 bushels, 86.6 per cent of the average. Corn raised will amount to 3,312,000,000 bushels,

which is 14.1 per cent greater than the average production for the last five years. Other crops are estimated as follows:

Rye, 147,000,000 bushels, 92.2 per cent; barley, 587,000,000 bushels, 96 per cent; oats, 2,682,000,000 bushels, 113.9 per cent; rice, 70,000,000 bushels, 115.5 per cent; flaxseed, 38,000,000 bushels, 69.8 per cent; potatoes, 719,000,000 bushels, 112.4 per cent; sugar beets, 10,000,000 short tons, 106.6 per cent; tobacco, 1,186,000,000 pounds, 112.5 per cent.

## UNITED STATES NOVEMBER CROP REPORT

Preliminary estimates of a number of United States crops are given as follows in the November Crop Reporter. Compari-

sons are made with the final estimates for 1916 and the five years' average 1911-15.

CROPS	1917 Estimate	1916 Crop	1911-15 Average
Corn.....bus.	3,191,083,000	2,583,241,000	2,754,164,000
Buckwheat....."	16,813,000	11,840,000	16,514,000
Potatoes....."	439,686,000	285,437,000	362,910,000
Sweet potatoes....."	84,727,000	70,955,000	60,257,000
Tobacco.....lb.	1,185,478,000	1,150,622,000	983,723,000
Flaxseed.....bus.	9,648,000	15,459,000	18,615,000
Pears....."	11,419,000	10,377,000	11,341,000
Apples.....bbls.	177,733,000	202,245,000	215,572,000
Sugar beets.....tons	7,621,000	6,228,000	5,839,000
Kaifrs.....bus.	73,380,000	50,340,000	.....

## OCTOBER REPORT OF THE BRITISH BOARD OF AGRICULTURE

The reports furnished by the Crop Reporters of the Board on agricultural conditions in England and Wales indicate that September was upon the whole favourable to agriculture in the eastern half of the country; on the western side the weather was more unsettled, and harvest operations were delayed accordingly. Over the greater part of England the corn was secured, generally by the second or third week of the month, in satisfactory condition; but in the west a certain quantity still remained to be carted, and some in Wales had still to be cut, while much was harvested in damp condition.

The potato crop is now being lifted; in some districts much progress has been made, and in others little has been done, especially in the west, where the late harvest and rainy weather have rather

postponed this work. There is a good deal of disease in the south-west, but the position does not appear to be so bad as was feared; and in the rest of the country there is very little disease. Except in the north-west, the crop is everywhere above average, especially in the eastern counties, and the yield is expected to be 4 per cent above average.

Turnips and swedes are bad in the eastern and north-eastern counties, where there is a thin plant; but elsewhere they appear to be average, and even more in the southwest. On the whole the plant is expected to be 5 per cent below the average. Mangolds, on the other hand, are everywhere satisfactory, though they might have been improved by warmer weather, and the yield will probably be 3 per cent over average.

## BROOMHALL'S FOREIGN CROP CABLE NOVEMBER 20th, 1917

*United Kingdom.*—Weather wet and cool. Movement is slow and foreign arrivals lighter. Native wheat and oats moving slowly and receipts command firm prices. The quality fair.

*Balkan States.*—Weather favoured seeding and from best information the acreage is large. Stocks and reserves are good and overland shipments have been important. There is no scarcity reported.

*Hungary.*—Neutral advices refer favorably to seeding and also stocks of grain.

*Scandinavian Peninsula.*—Weather cold and wet, supplies are light and great scarcity is reported. Foreign arrivals are increasing and it is expected that arrivals will continue on a limited scale.

*Spain.*—Weather favourable for seeding and a full acreage is reported. Supplies of both native and foreign wheat are liberal and normal conditions exist.

*North Africa.*—Weather and crop advices favourable. Acreage to wheat large. Shipments moderate of wheat and corn.

*Russia.*—Weather generally is unfavourable for agriculture and sowing disappointing. This is largely due to labour trouble

and the great unrest throughout the country and already supplies for natives are becoming apprehensive. The government has confiscated all grain supplies and great scarcity is noted in parts, as railway facilities are poor.

*France.*—Sowing is mostly finished, with the acreage moderate, owing to unfavourable weather and scarcity of labour and seed. Stocks everywhere are light of all grains and buyers are anxious. Large purchases have been made in Australia, which is slow of movement, and Argentine purchases liberal for January shipment. American wheat arriving slowly. Interior stocks small. Import needs important.

*Italy.*—Seeding is progressing, with weather favourable. Labour is scarce, and seed not plentiful and the recent cold weather was against agriculture. Estimates of the acreage are pessimistic. Supplies moving slowly. Foreign arrivals moderate.

*Argentine.*—Weather favourable in the north and centre and harvesting is progressing with yield and quality fully up to expectations. Weather is cool and parts wet, and this is not favourable. Arrivals in port show a better quality. Freights advancing with scarcity.

## EXPORTS FROM THE UNION OF SOUTH AFRICA

YEARS	Coarse Wool	Sheepskins	Goatskins	Ostrich Feathers
	Lb.	Lbs.	Lbs.	Lbs.
1916.....	136 359,000	30,406,000	8,511,000	452,000
1915.....	169,961,000	37,326,000	8,302,000	949,000
1914.....	133,943,000	30,345,000	7,939,000	755,000
1913.....	176,921,000	32,187,000	9,102,000	1,633,000
1912.....	161,928,000	.....	.....	999,000
1911.....	132,169,000	.....	.....	827,000

## LIVE STOCK STATISTICS

## DENMARK

Numbers of live stock in Denmark in 1917 and 1914.

CLASSIFICATION	July 12, 1917	July 15, 1914
Horses.....	572,412	567,240
Cattle.....	2,458,158	2,462,862
Sheep.....	480,007	514,908
Pigs.....	1,650,623	2,496,706
Poultry.....	12,287,795	15,140,072

## FRANCE

Numbers of live stock in France in 1917 and 1913.

CLASSIFICATION	July 1, 1917	Dec. 31, 1913
Horses.....	2,282,560	3,222,080
Asses.....	324,580	356,310
Mules.....	150,115	188,280
Cattle.....	12,443,304	14,787,710
Sheep.....	10,586,594	16,131,390
Pigs.....	4,200,280	7,035,850

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